US009055403B2

(12) **United States Patent**
**Bocking et al.**

(10) **Patent No.: US 9,055,403 B2**
(45) **Date of Patent: *Jun. 9, 2015**

(54) **PUBLISHING LOCATION FOR A LIMITED TIME**

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(73) Assignee: **BlackBerry Limited**, Waterloo (CA)

( * ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **14/202,785**

(22) Filed: **Mar. 10, 2014**

(65) **Prior Publication Data**

US 2014/0256350 A1 Sep. 11, 2014

**Related U.S. Application Data**

(63) Continuation of application No. 12/420,391, filed on Apr. 8, 2009, now Pat. No. 8,688,779.

(51) **Int. Cl.**

| | |
|---|---|
| ***G06F 15/16*** | (2006.01) |
| ***H04W 4/02*** | (2009.01) |
| ***H04L 29/08*** | (2006.01) |
| *H04W 8/18* | (2009.01) |

(52) **U.S. Cl.**
CPC . ***H04W 4/02*** (2013.01); *H04W 8/18* (2013.01); ***H04L 67/18*** (2013.01)

(58) **Field of Classification Search**
None
See application file for complete search history.

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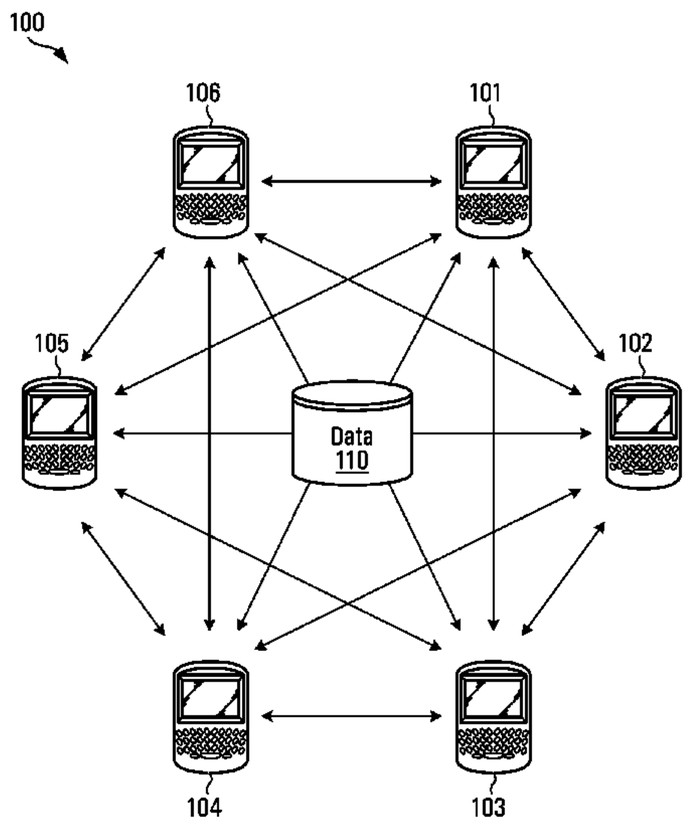
*Primary Examiner* — Michael Y Won
(74) *Attorney, Agent, or Firm* — Todd A. Keeler; Borden Ladner Gervais LLP

(57) **ABSTRACT**

A method and user device for limiting a time for which location data sharing is enabled for a user device of a data sharing group, the data sharing group comprising at least two user devices inclusive of the user device, each user device of the data sharing group configured to store data shared by user devices of the data sharing group on the respective user device and to maintain a list of the user devices in the data sharing group. The method comprises receiving an instruction through a user interface on the user device indicating that location data sharing is to be enabled for a limited time period after which location sharing is to be disabled, obtaining location data for the user device during the limited time period; and sending the location data to at least one other user device of the sharing group during the limited time period.

**10 Claims, 13 Drawing Sheets**



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Statement in accordance with the Notice from the European Patent Office dated Oct. 1, 2007 concerning business methods (OJ EPO Nov. 2007, 592-593) [XP002456252].

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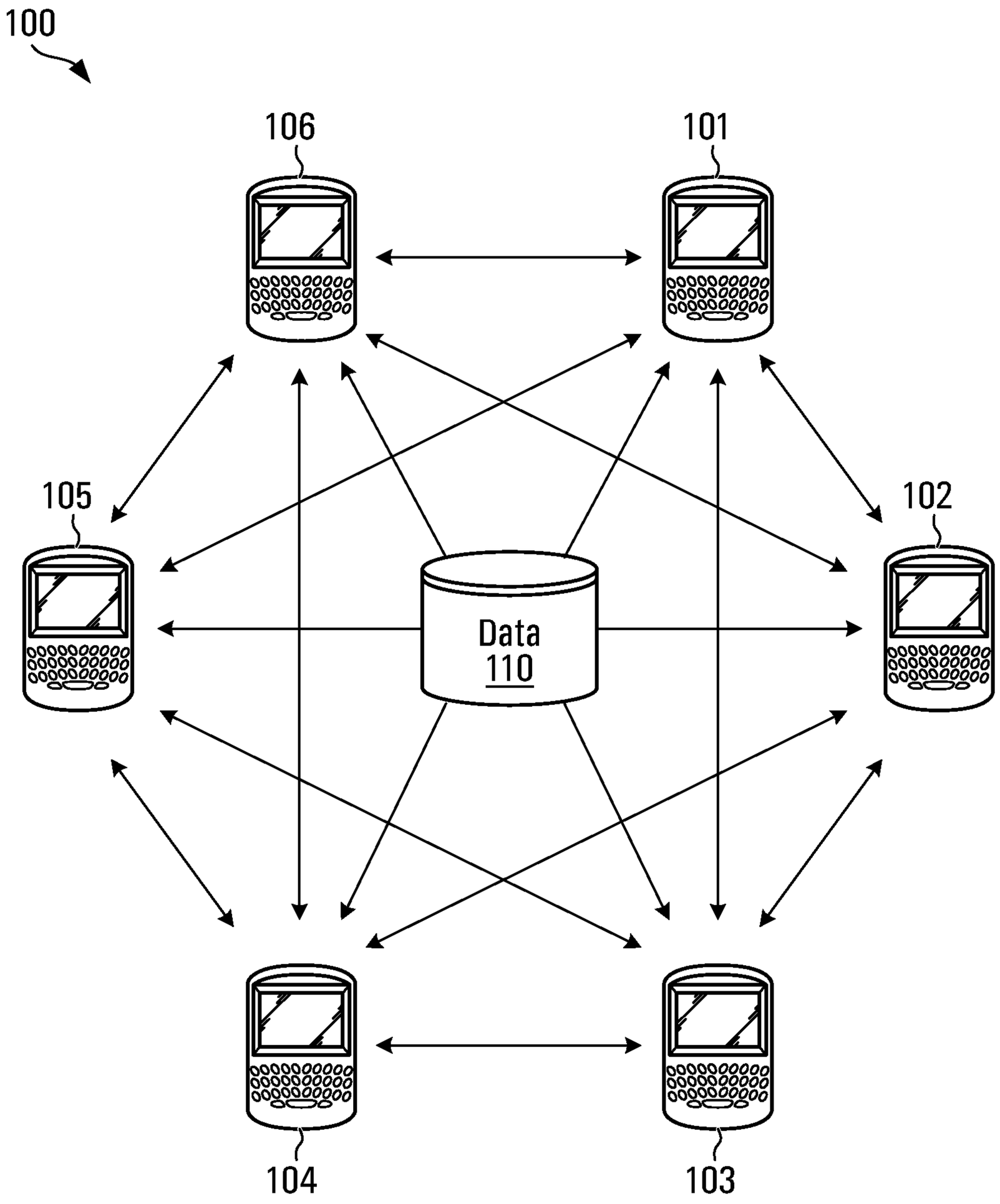



FIG. 1

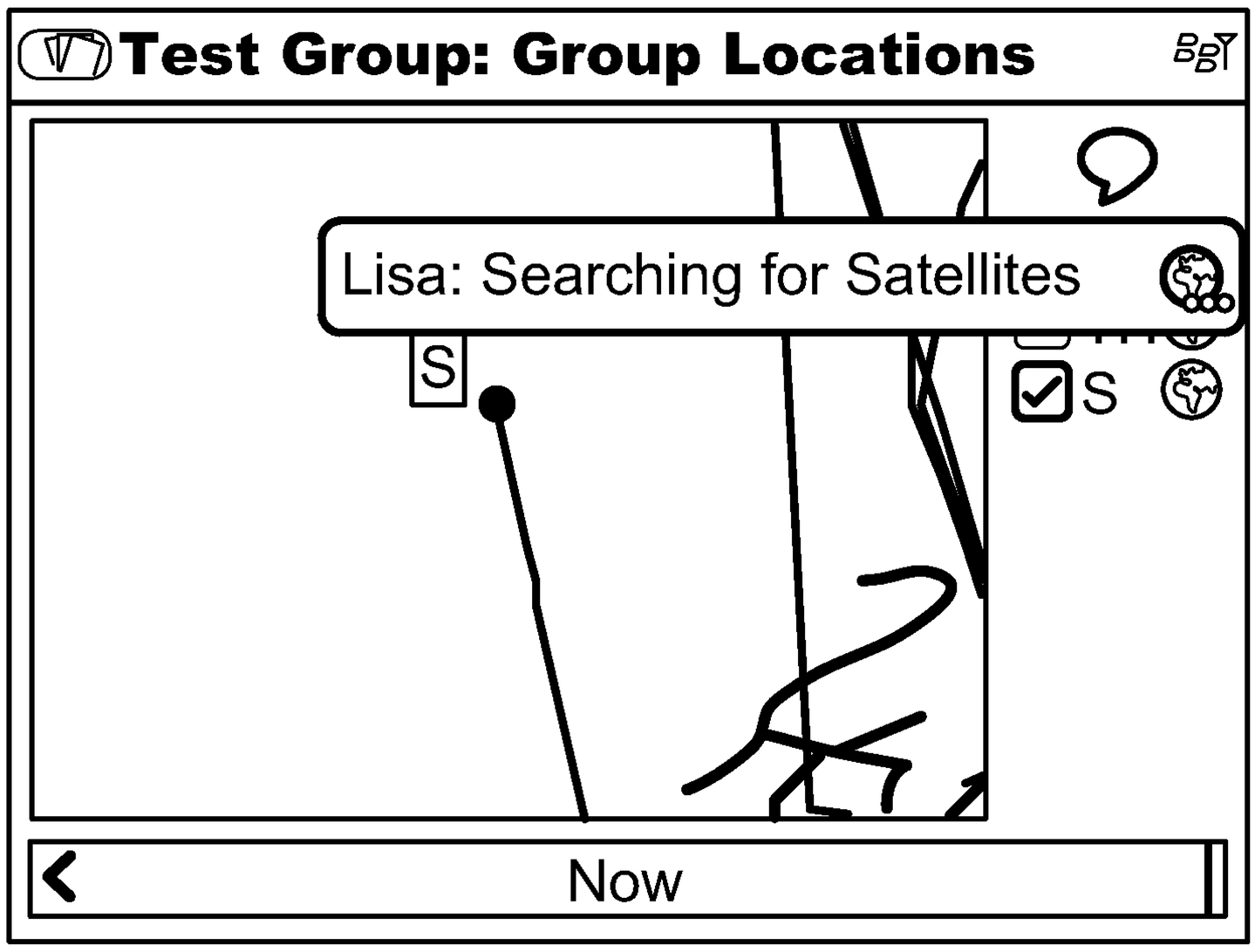

Test Group: Group Locations
Lisa: Searching for Satellites
S
S
Now

FIG. 2A

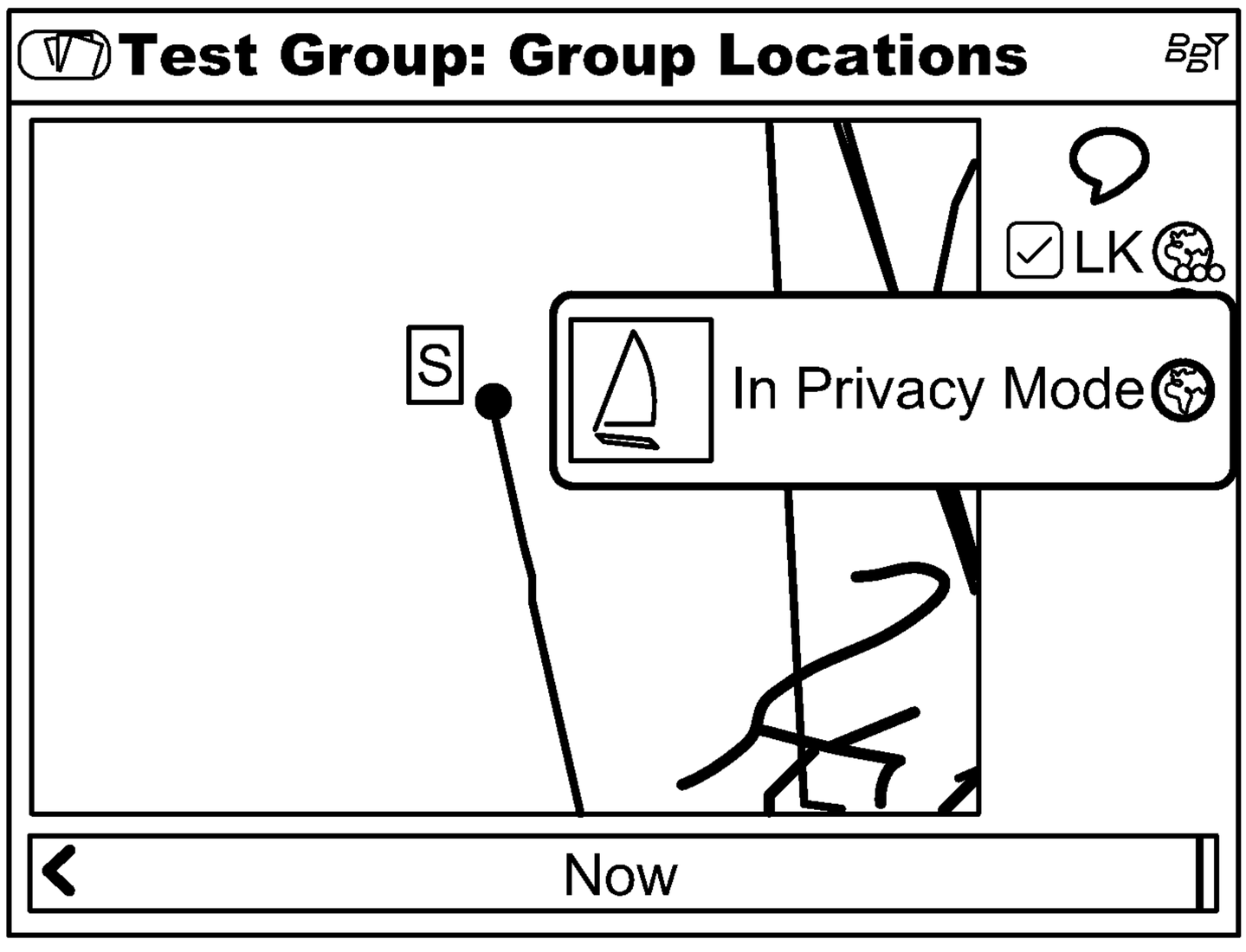

Test Group: Group Locations
LK
S
In Privacy Mode
Now

FIG. 2B

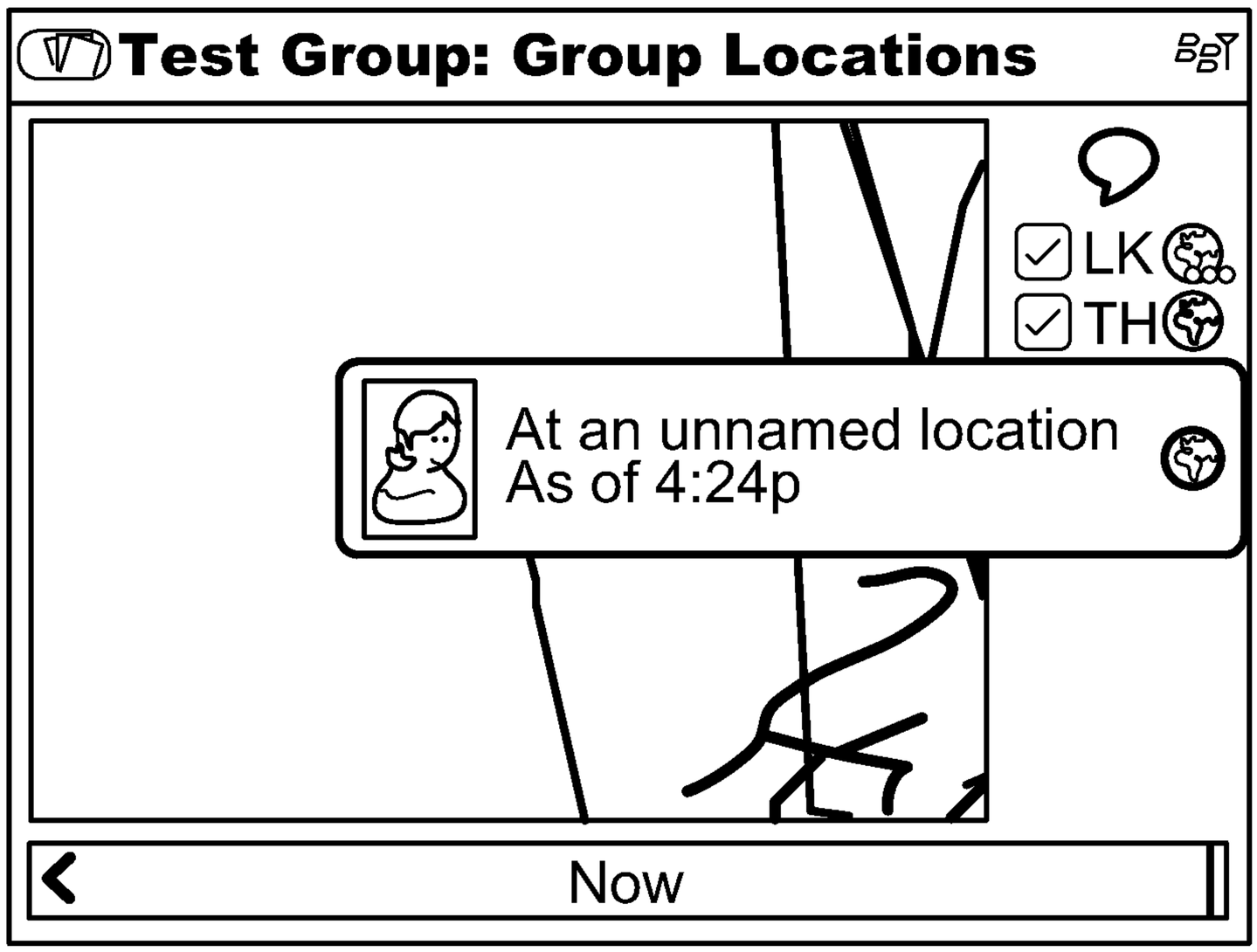

Test Group: Group Locations
LK
TH
At an unnamed location
As of 4:24p
Now

FIG. 2C

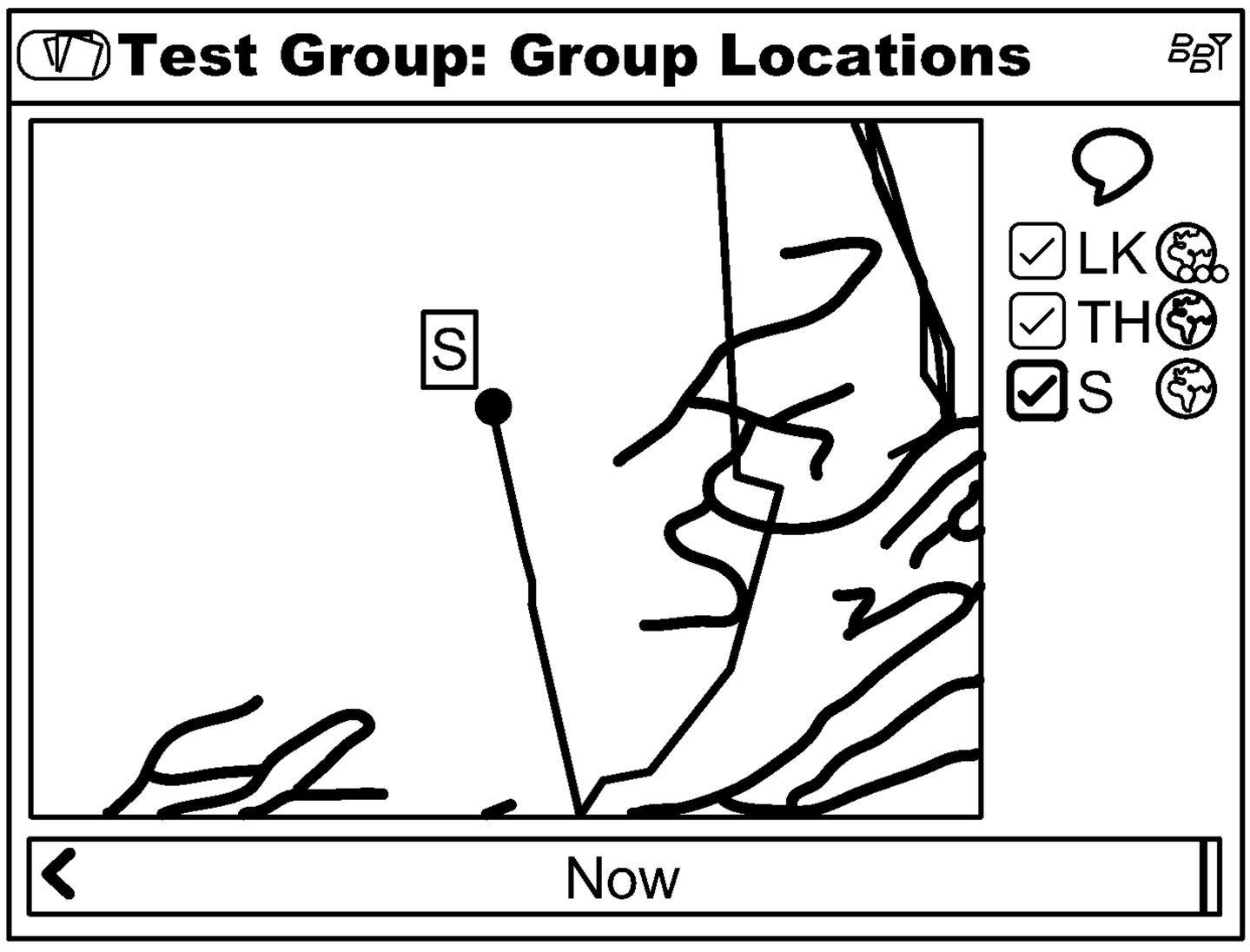

Test Group: Group Locations
LK
TH
S
S
Now

FIG. 2D

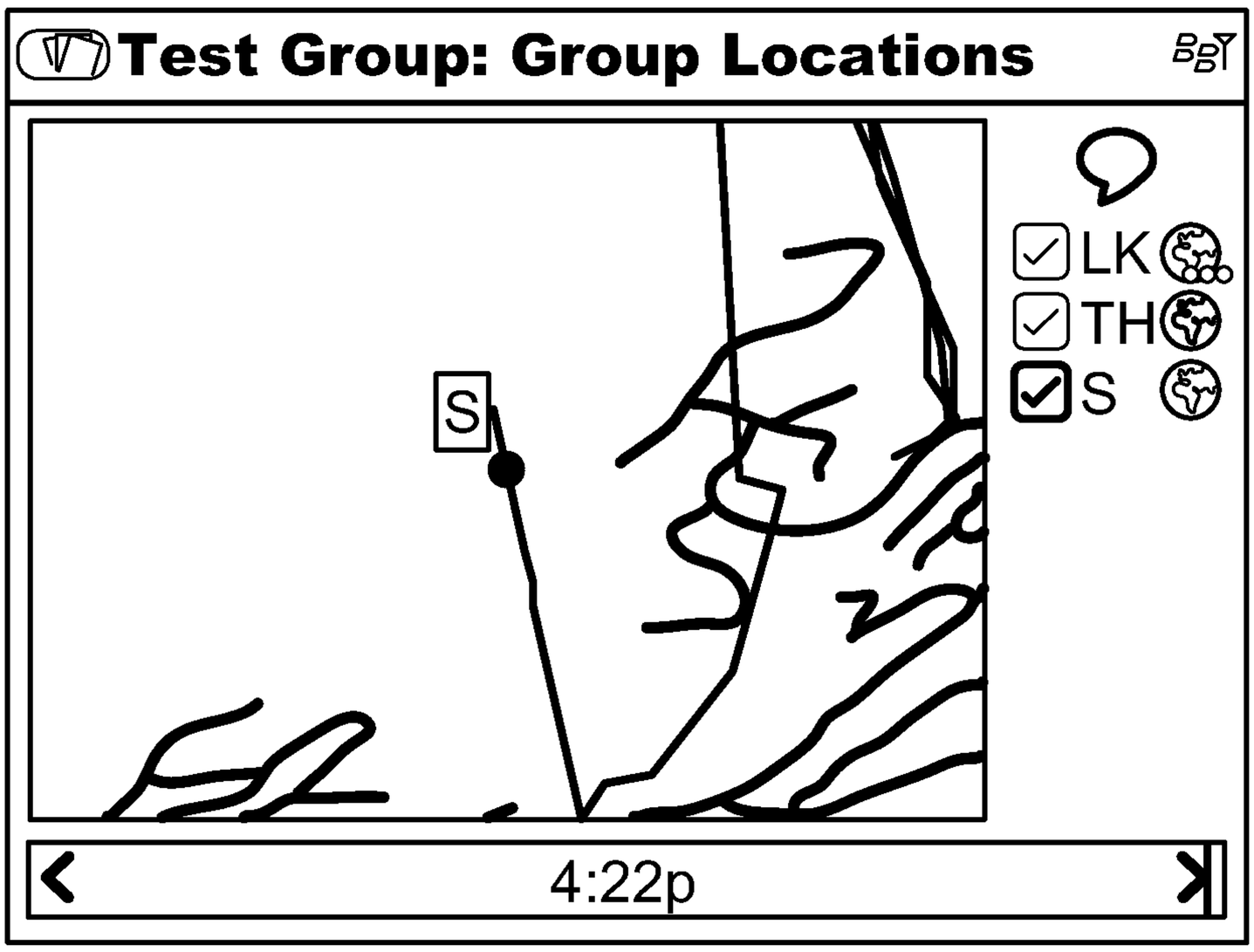

Test Group: Group Locations
S
LK
TH
S
4:22p

FIG. 2E

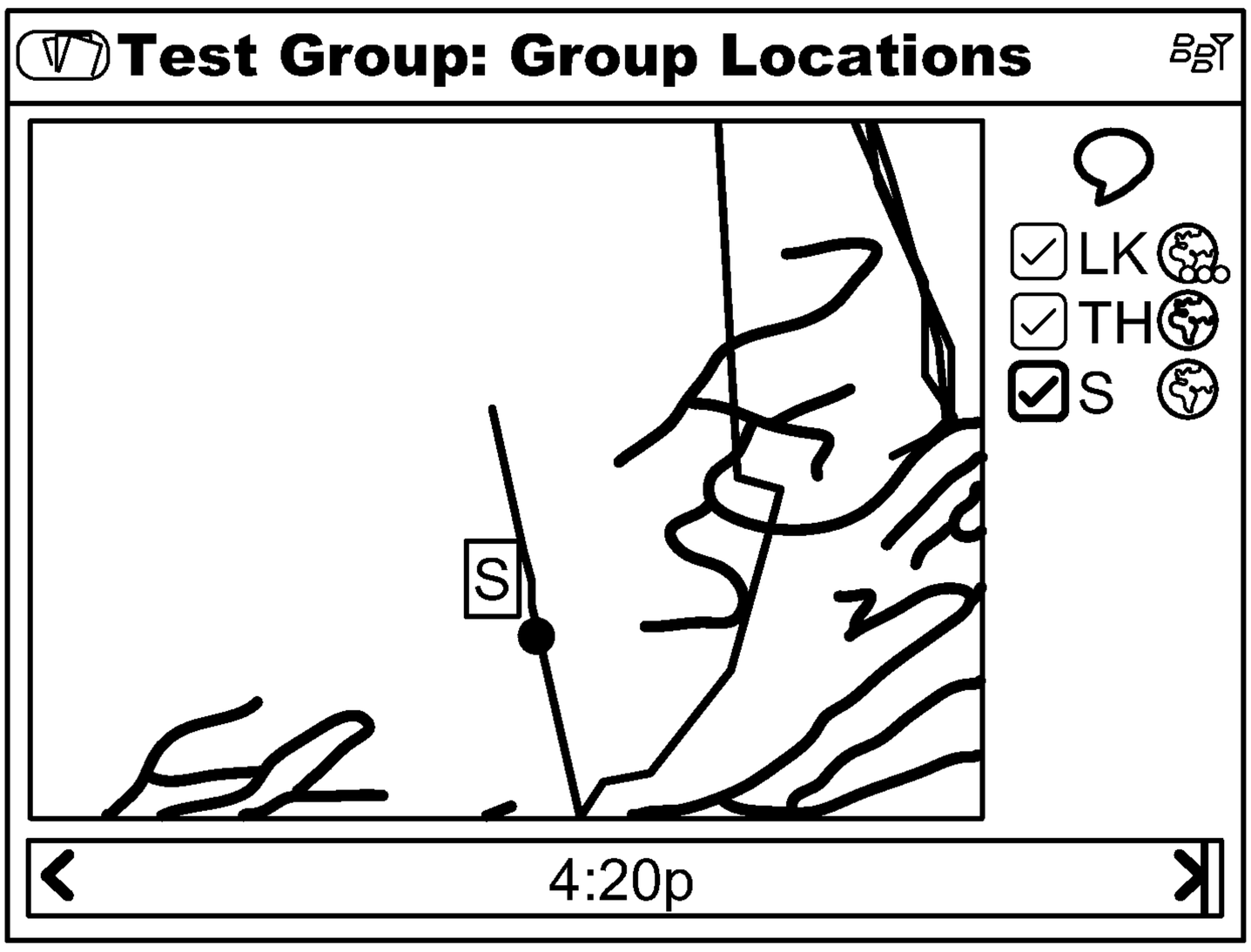

Test Group: Group Locations
LK
TH
S
S
4:20p

FIG. 2F

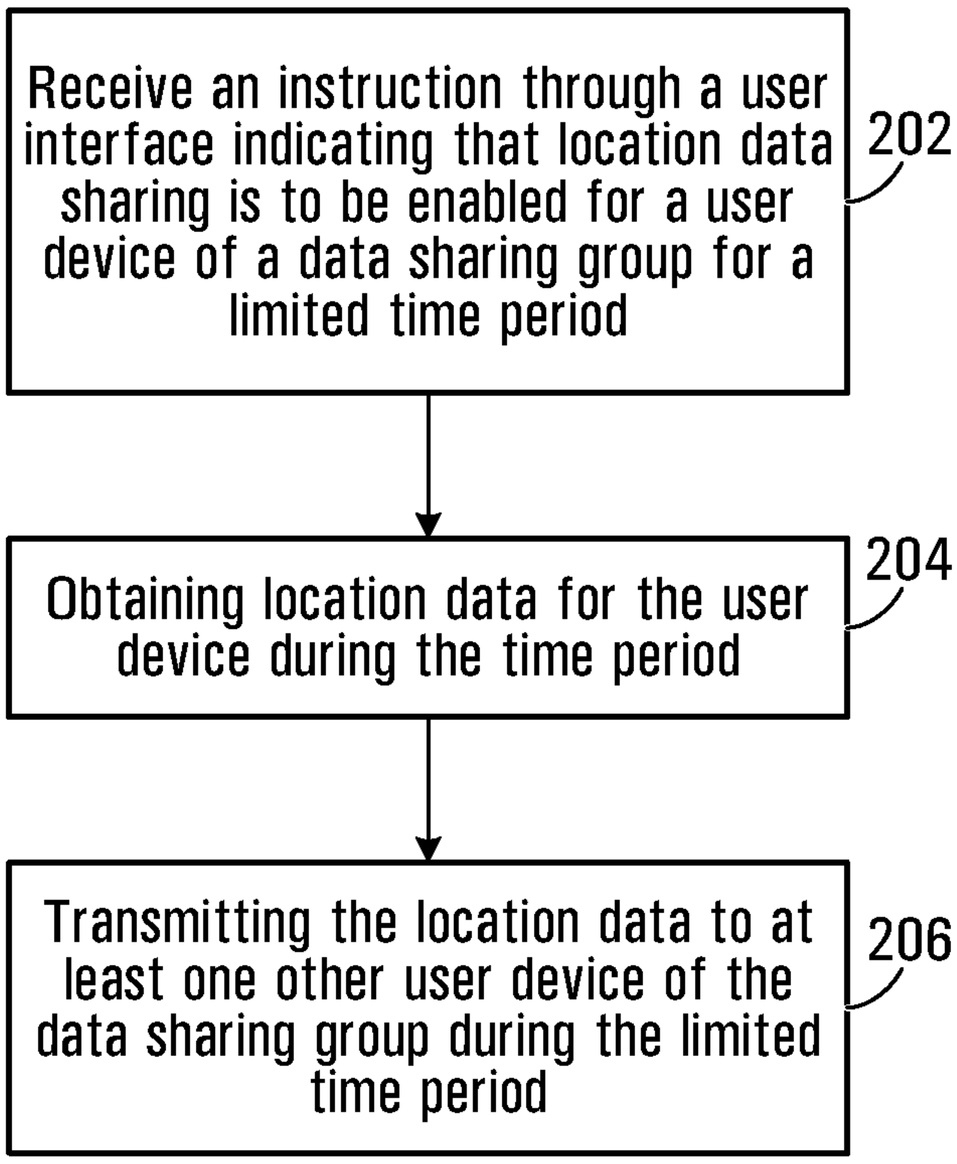

Receive an instruction through a user interface indicating that location data sharing is to be enabled for a user device of a data sharing group for a limited time period
202
Obtaining location data for the user device during the time period
204
Transmitting the location data to at least one other user device of the data sharing group during the limited time period
206

FIG. 3

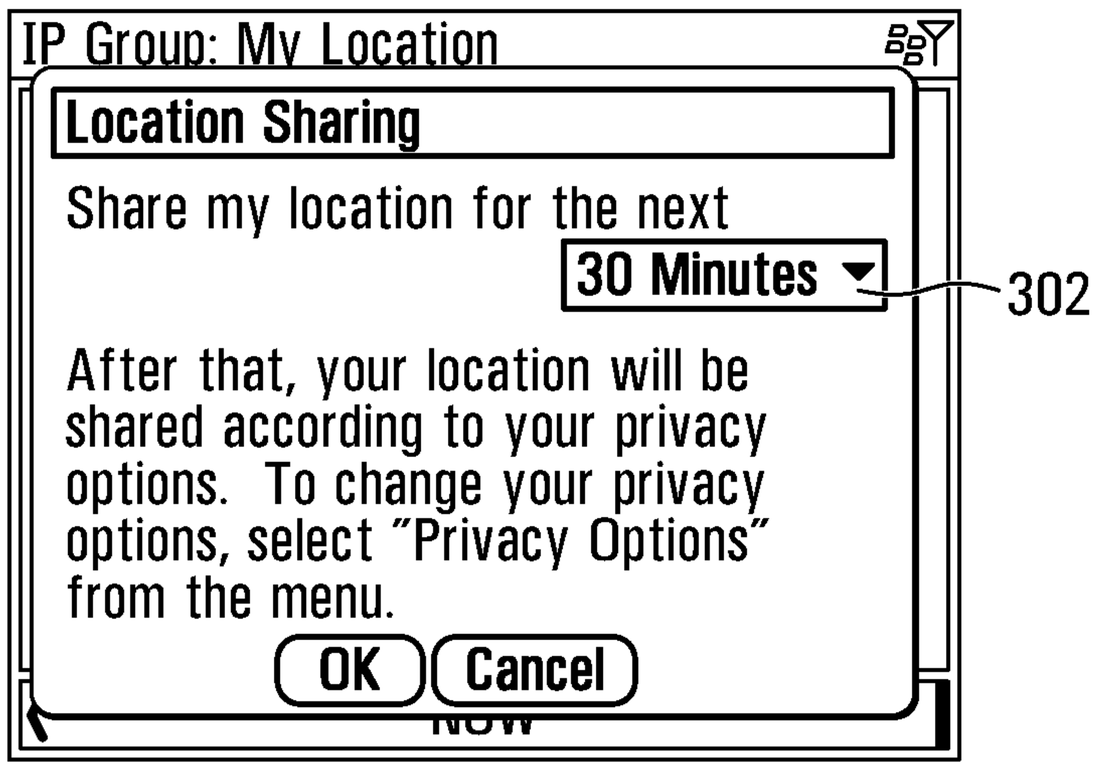

IP Group: My Location
Location Sharing
Share my location for the next
30 Minutes
After that, your location will be shared according to your privacy options. To change your privacy options, select "Privacy Options" from the menu.
OK
Cancel
302

FIG. 4A

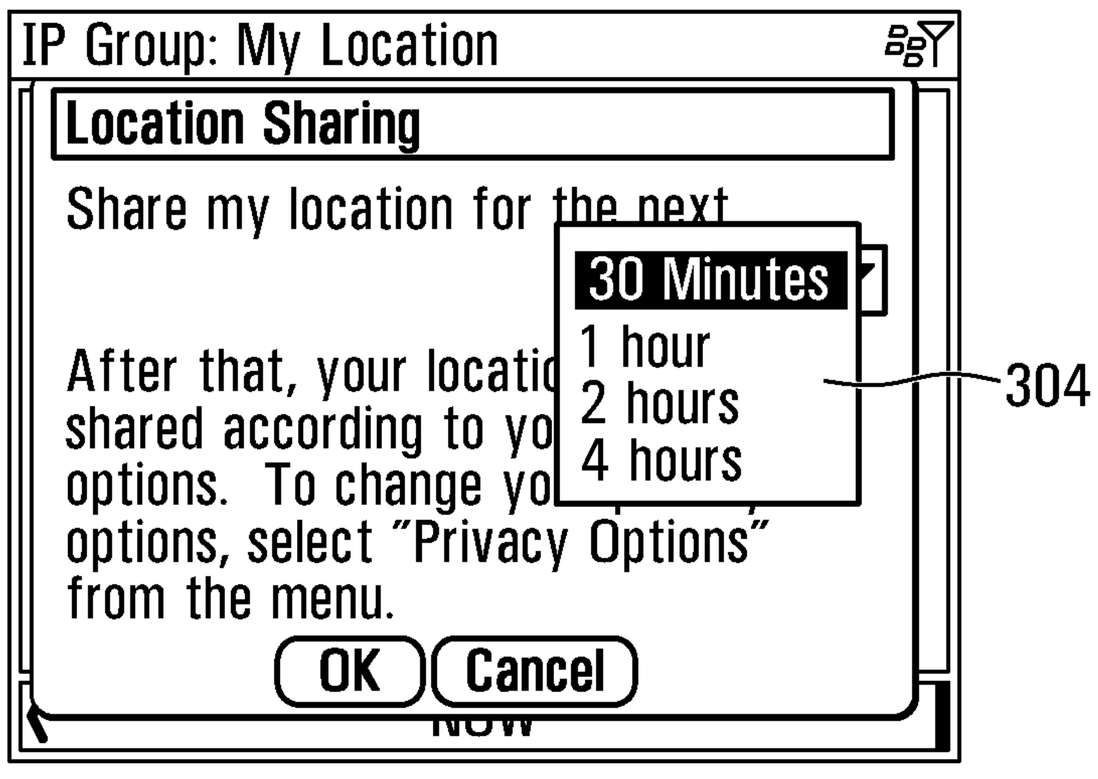

IP Group: My Location
Location Sharing
Share my location for the next
30 Minutes
1 hour
2 hours
4 hours
After that, your locatio
shared according to yo
options. To change yo
options, select "Privacy Options"
from the menu.
OK
Cancel
304

FIG. 4B

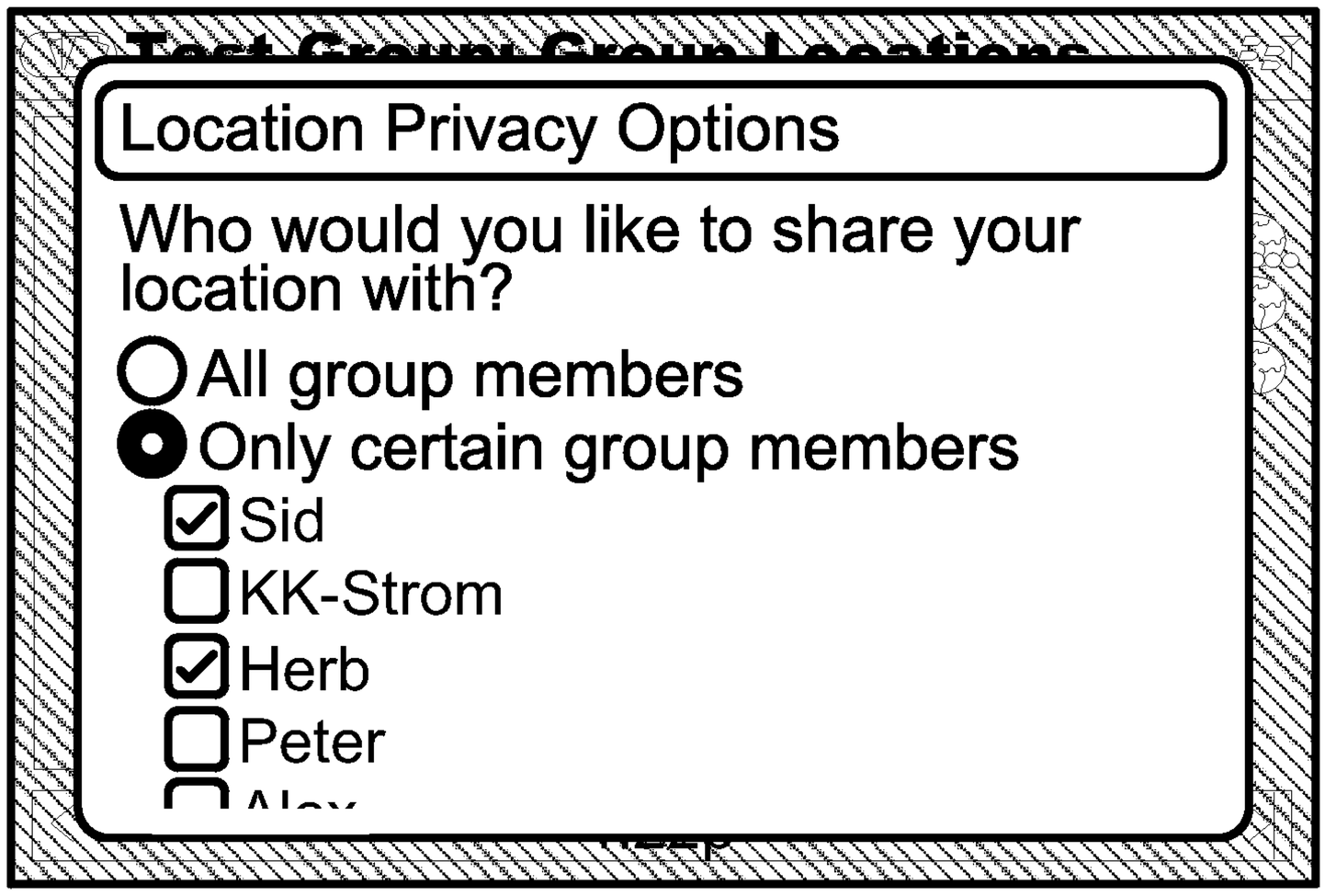

Location Privacy Options
Who would you like to share your location with?
All group members
Only certain group members
Sid
KK-Strom
Herb
Peter

FIG. 4C

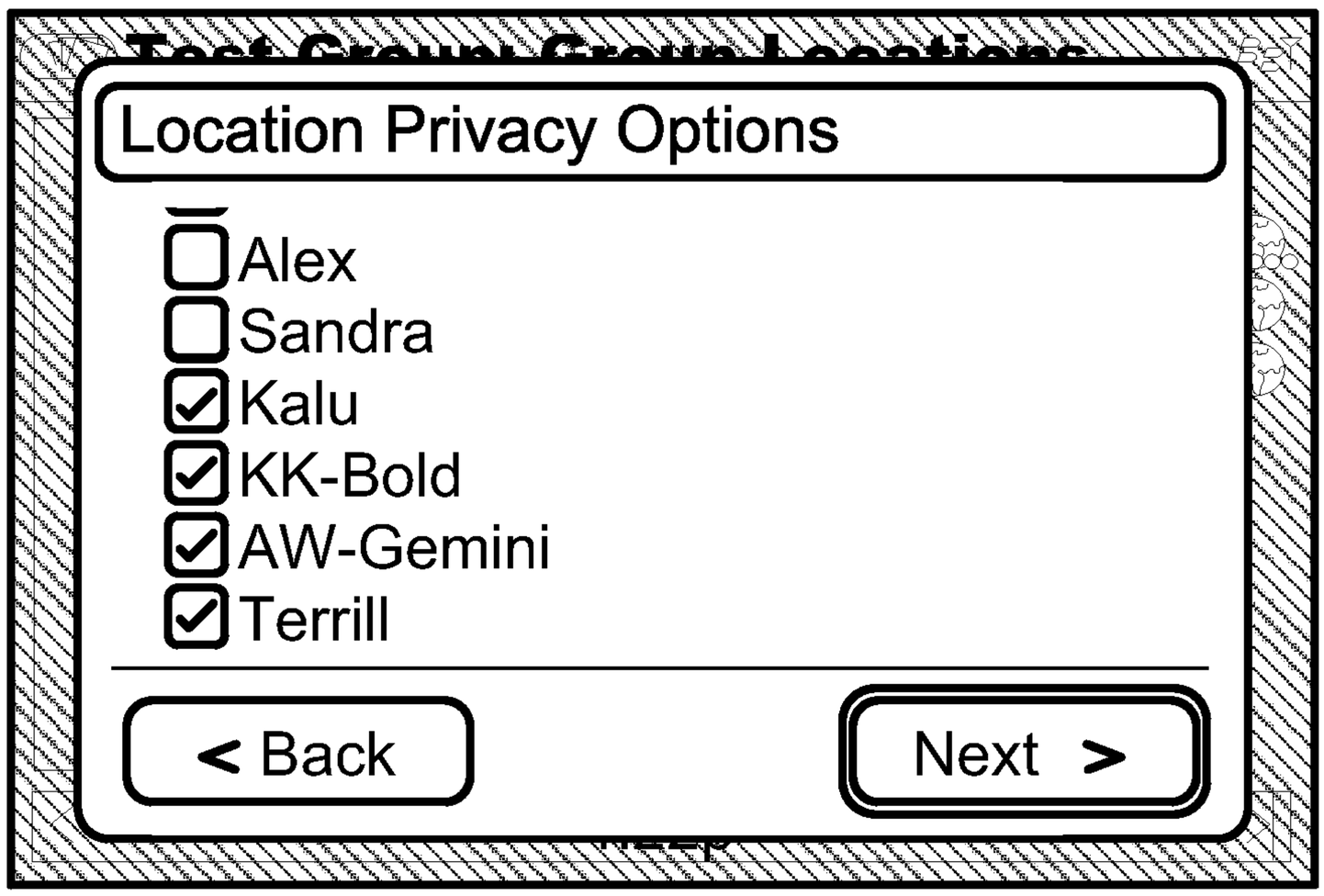

Location Privacy Options
Alex
Sandra
Kalu
KK-Bold
AW-Gemini
Terrill
< Back
Next >

FIG. 4D

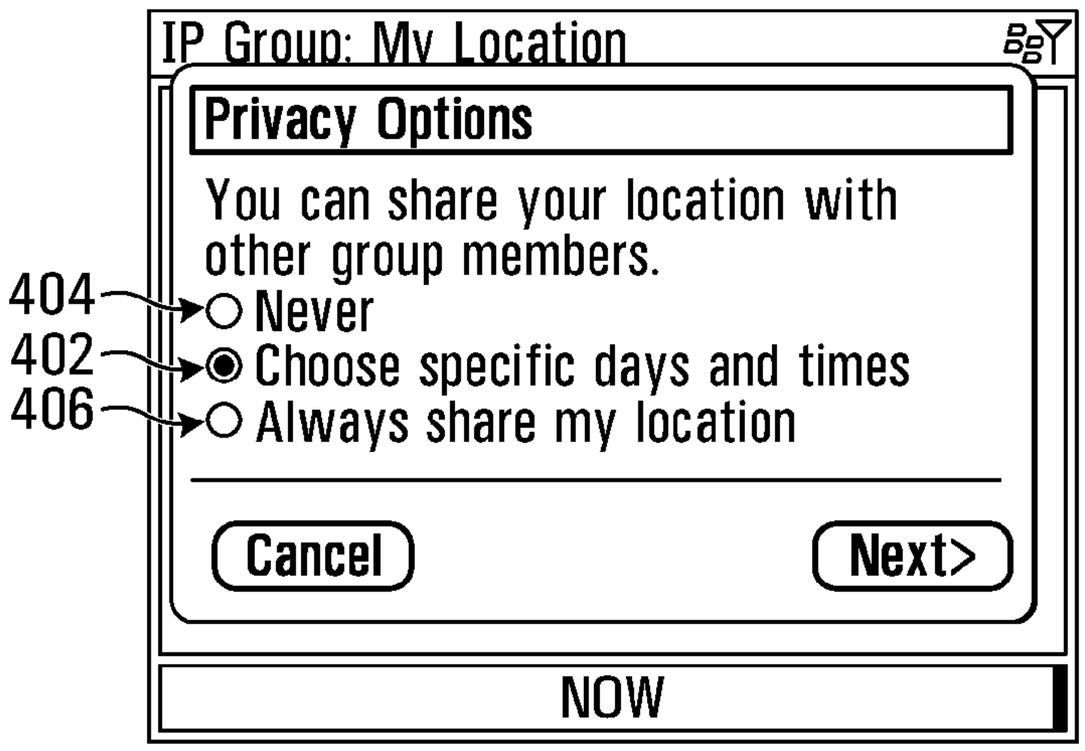



FIG. 5A

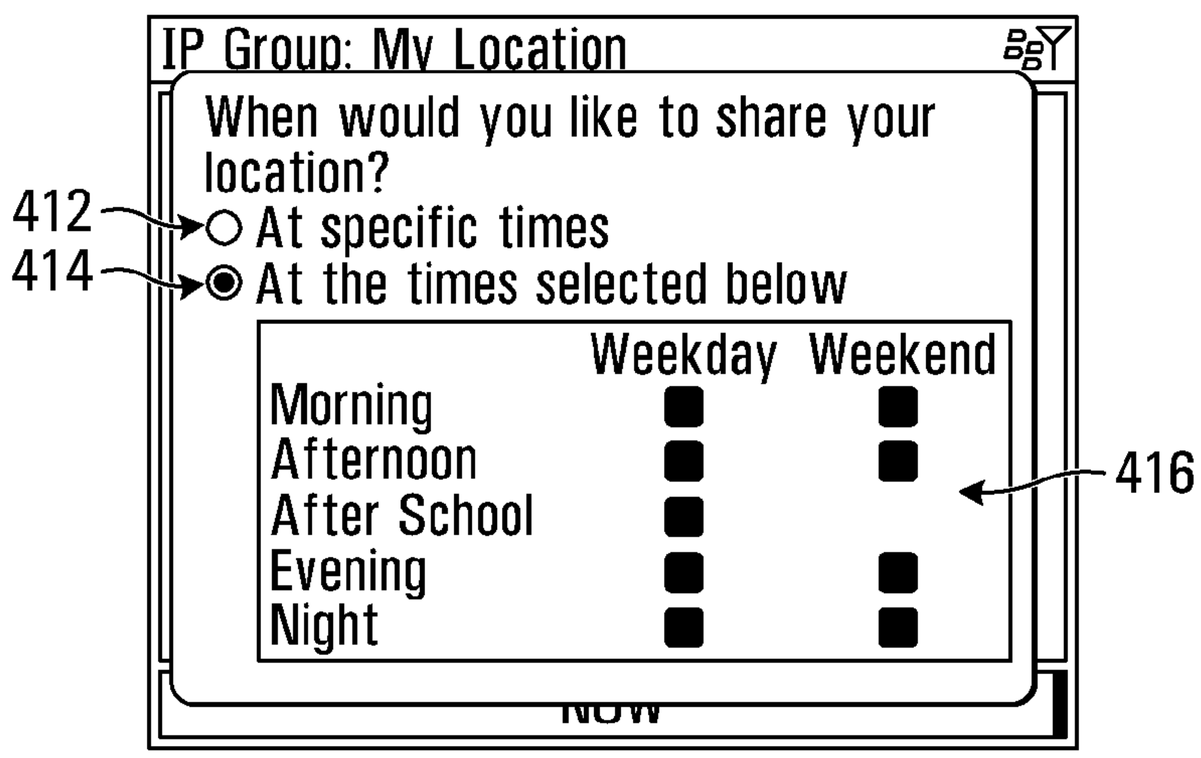



FIG. 5B

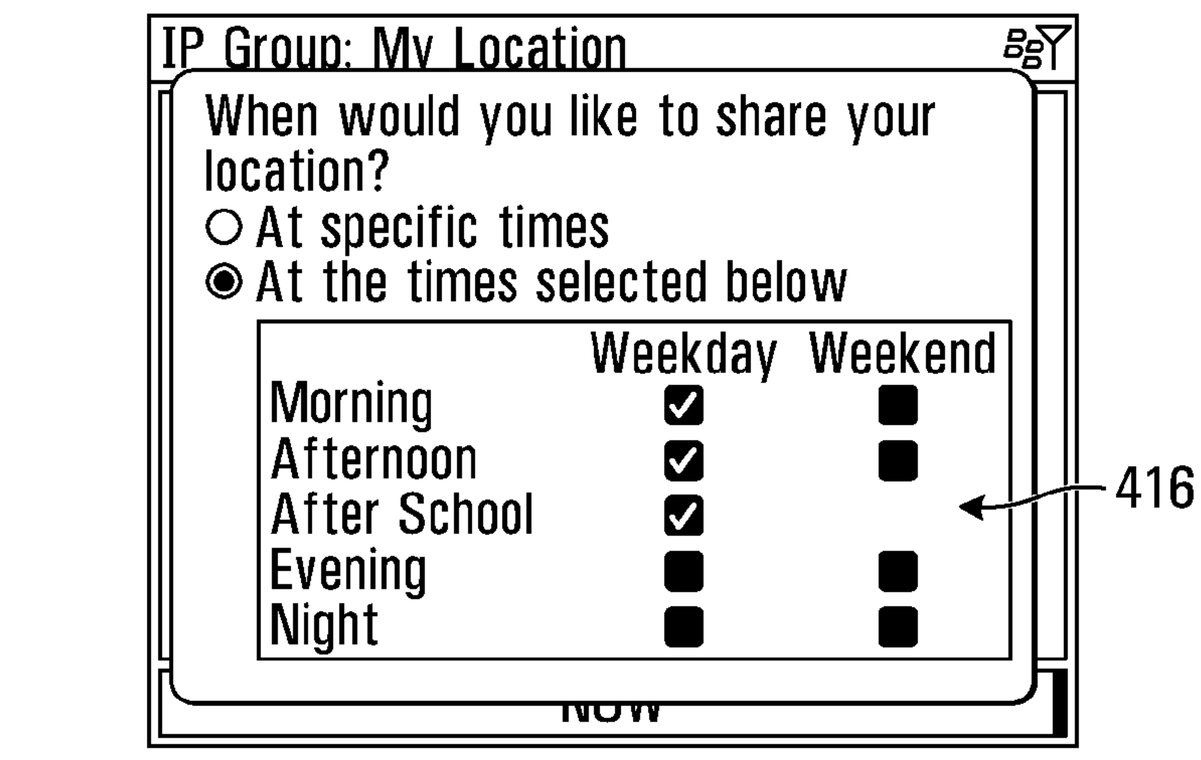



FIG. 5C

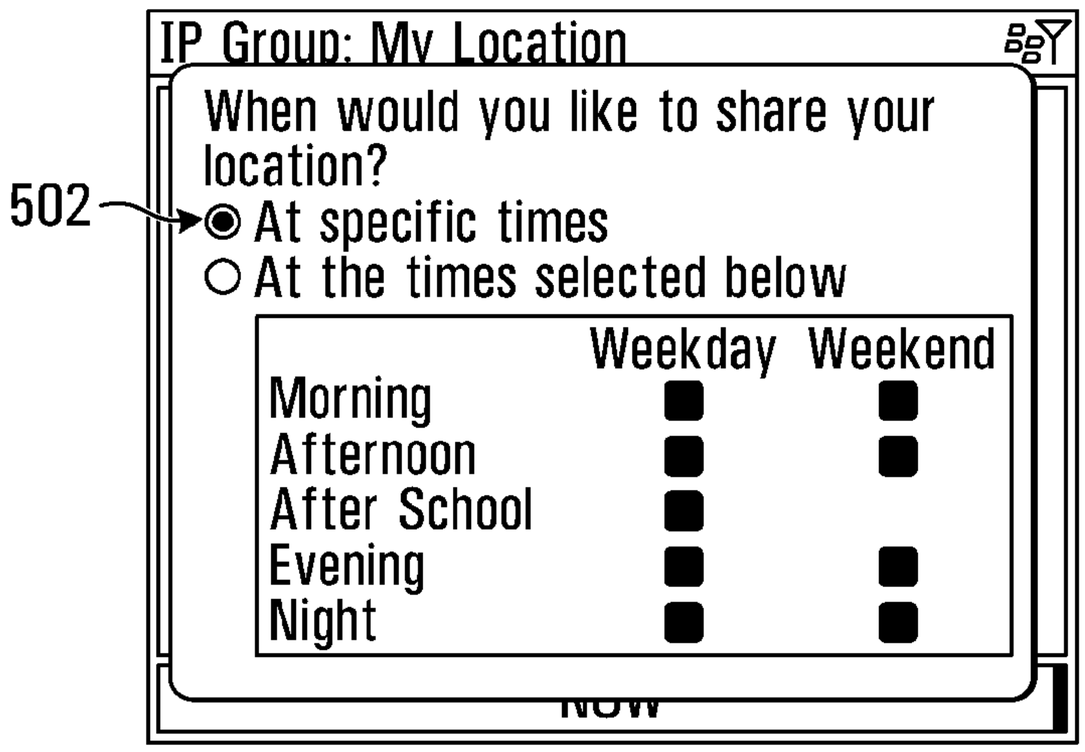



FIG. 6A

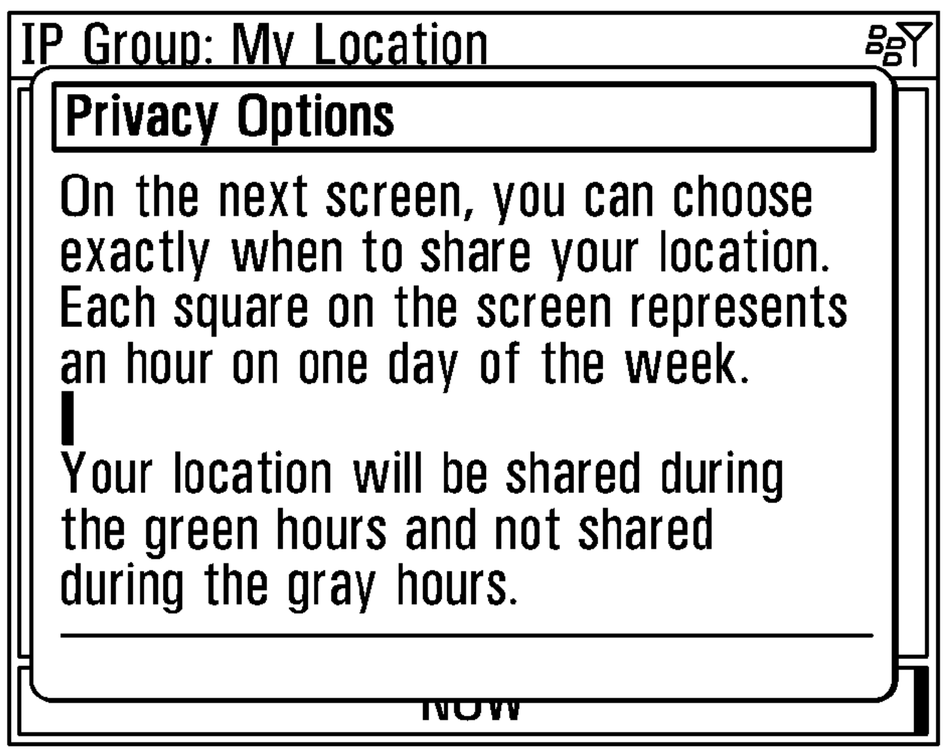



FIG. 6B

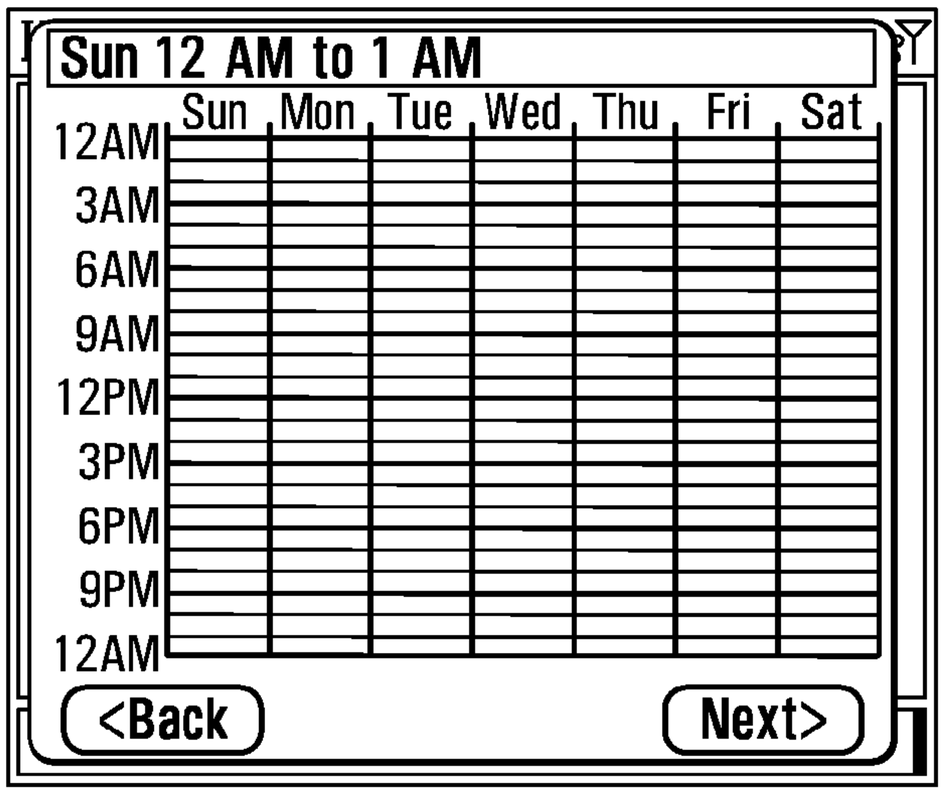



FIG. 6C

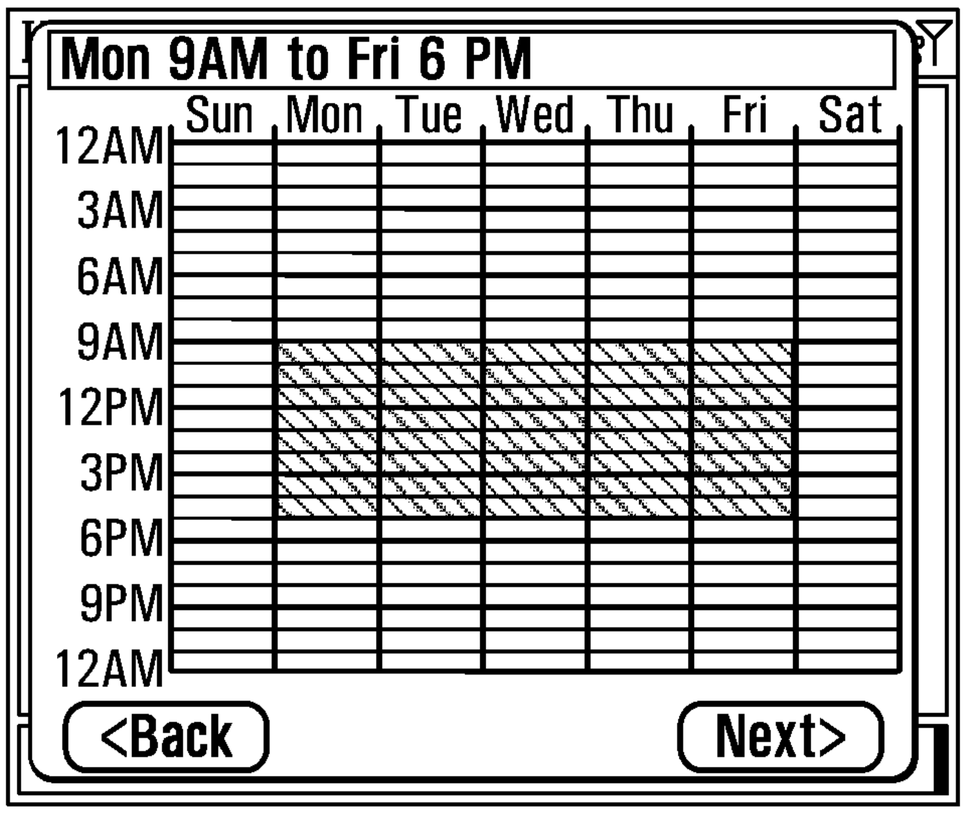
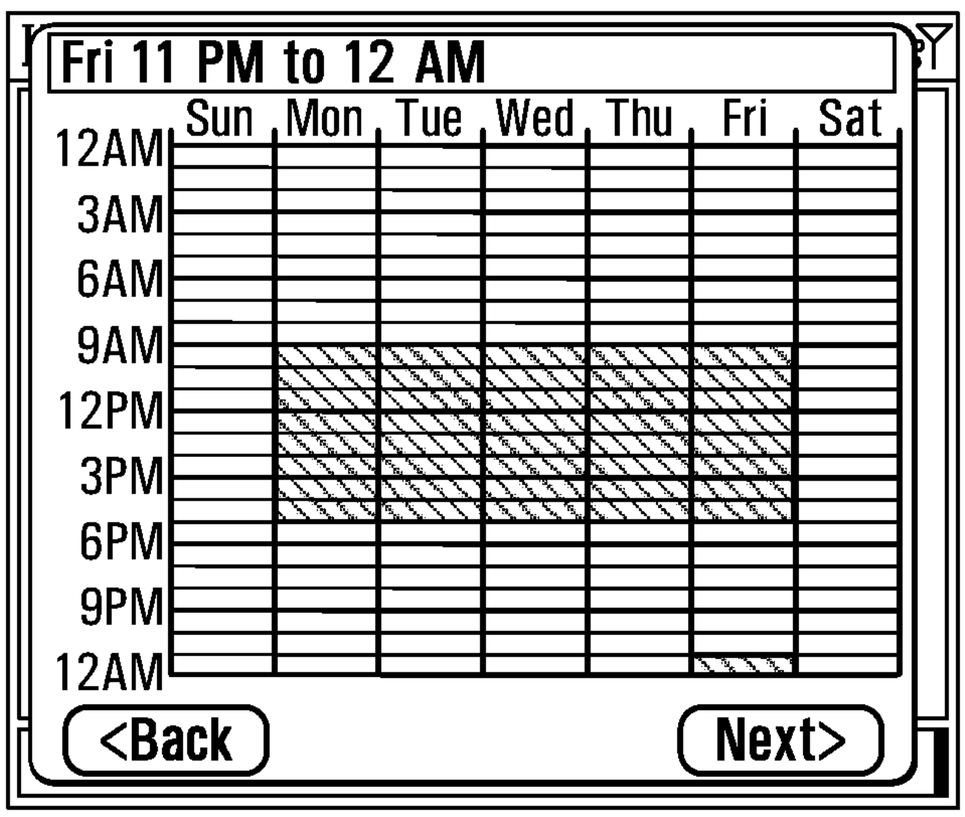

Mon 9AM to Fri 6 PM
Sun
Mon
Tue
Wed
Thu
Fri
Sat
12AM
3AM
6AM
9AM
12PM
3PM
6PM
9PM
12AM
<Back
Next>

FIG. 6D


Fri 11 PM to 12 AM
Sun
Mon
Tue
Wed
Thu
Fri
Sat
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3AM
6AM
9AM
12PM
3PM
6PM
9PM
12AM
<Back
Next>

FIG. 6E

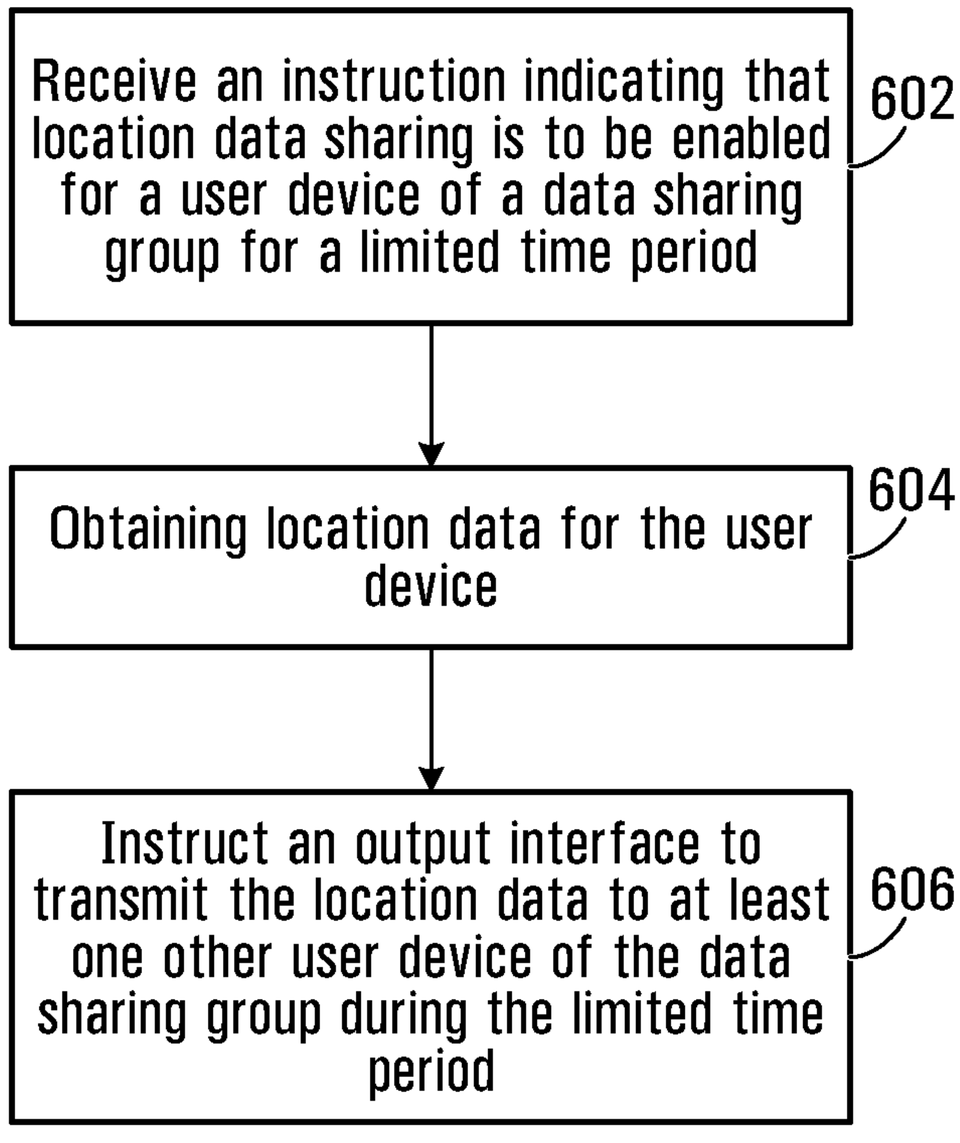
Receive an instruction indicating that location data sharing is to be enabled for a user device of a data sharing group for a limited time period
602
Obtaining location data for the user device
604
Instruct an output interface to transmit the location data to at least one other user device of the data sharing group during the limited time period
606

FIG. 7

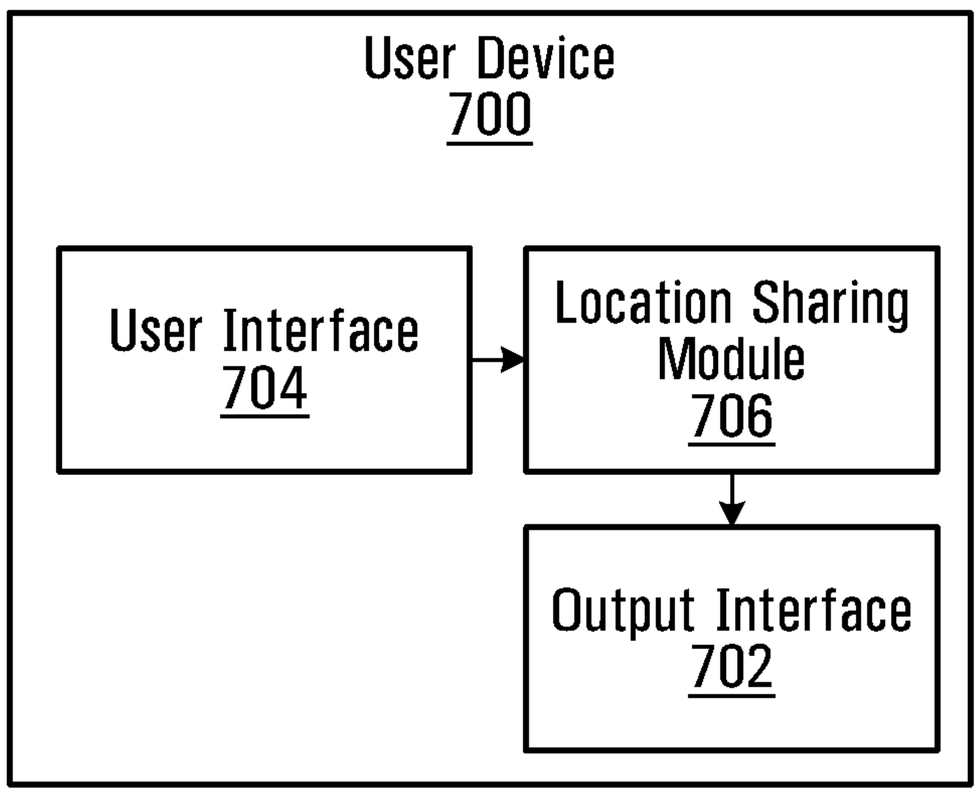
User Device
700
User Interface
704
Location Sharing
Module
706
Output Interface
702

FIG. 8A

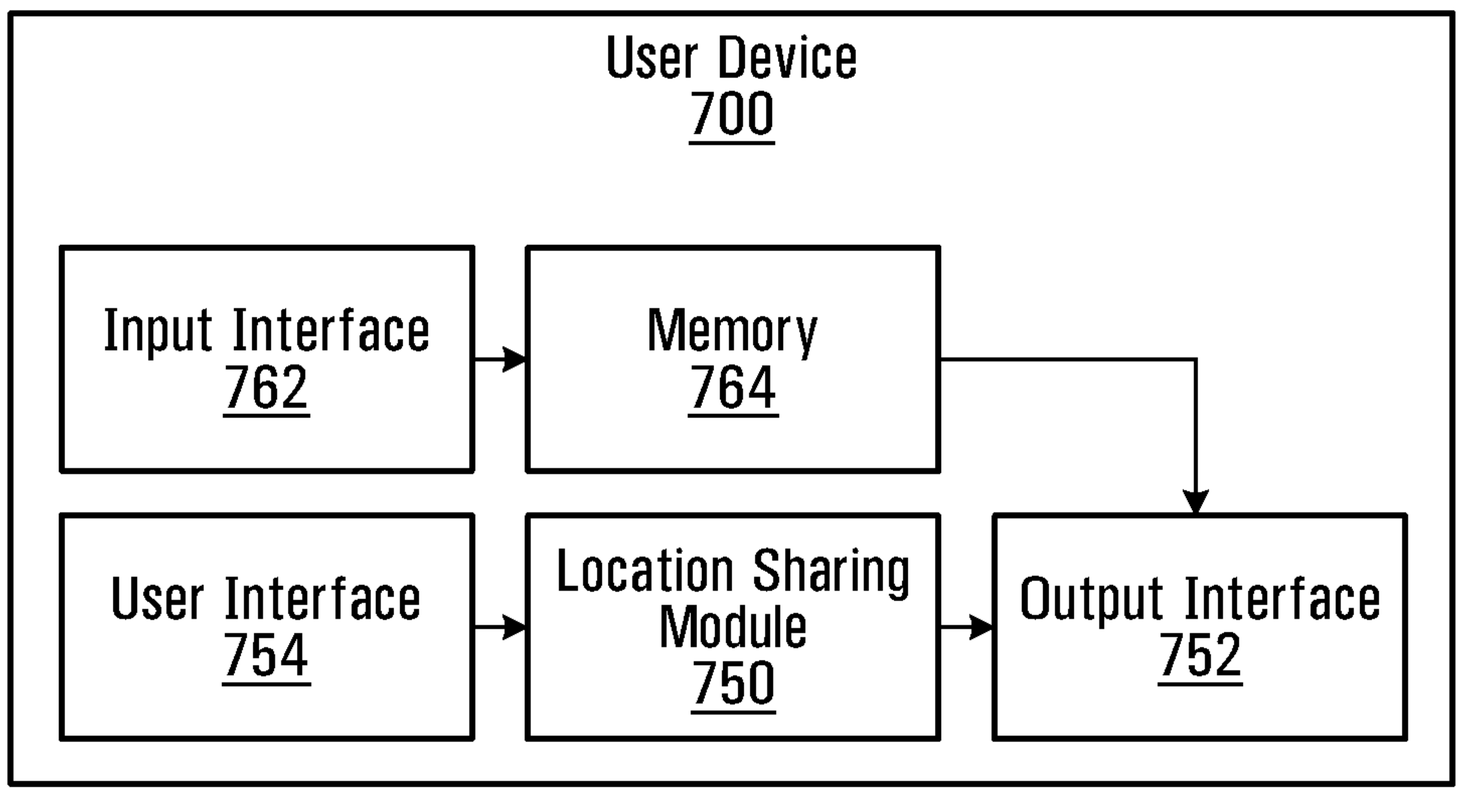
User Device
700
Input Interface
762
Memory
764
User Interface
754
Location Sharing
Module
750
Output Interface
752

FIG. 8B

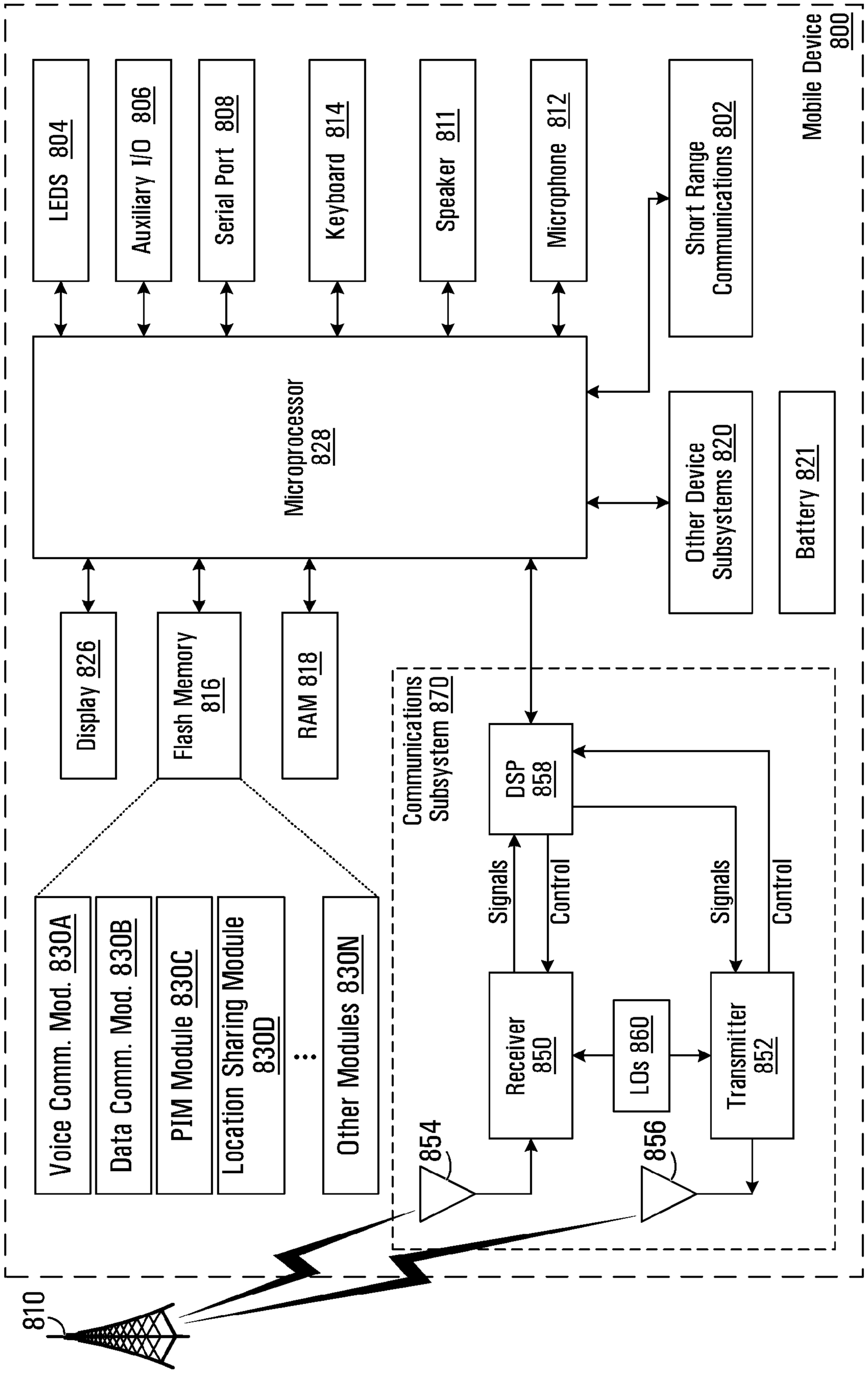
Mobile Device 800
LEDS 804
Auxiliary I/O 806
Serial Port 808
Keyboard 814
Speaker 811
Microphone 812
Short Range Communications 802
Microprocessor 828
Display 826
Flash Memory 816
RAM 818
Other Device Subsystems 820
Battery 821
Communications Subsystem 870
DSP 858
Signals
Control
Signals
Control
Receiver 850
LOs 860
Transmitter 852
854
856
Voice Comm. Mod. 830A
Data Comm. Mod. 830B
PIM Module 830C
Location Sharing Module 830D
Other Modules 830N
810

FIG. 9

# PUBLISHING LOCATION FOR A LIMITED TIME

## RELATED APPLICATION

The present application is a continuation of U.S. patent application Ser. No. 12/420,391 filed on Apr. 8, 2009. The present application claims the benefit of U.S. patent application Ser. No. 12/420,391 filed on Apr. 8, 2009, the entire contents of which are incorporated by reference.

## TECHNICAL FIELD

The present application relates to a user device and method for limiting a time for which location data sharing is enabled for a user device of a data sharing group.

## BACKGROUND

Data sharing group applications are used on user devices in networks to share information between members of one or more groups. For example, some such applications allow users to create static groups. Within each group, data, such as location, images, calendar information, or the like can be shared with other members of the group.

In some applications, the data shared amongst group members may include location data. For example, if location sharing is enabled by a user for a particular group of which the user is a member, other members of that group can access the location data of the user. In some applications, each member of the group can view the locations of each group member who has enabled location sharing on a map displayed on a respective user interface.

The location data that is shared in some of these applications is obtained from a GPS receiver in the respective user device.

For privacy reasons or for other reasons, a user may not wish to share location information with other group members at all times. As a result, there is a desire for a method of allowing the user to choose exactly when to share location information.

## BRIEF DESCRIPTION OF THE DRAWINGS

Examples of embodiments will now be described in greater detail with reference to the accompanying drawings, in which:

FIG. **1** is a schematic diagram of an exemplary peer-to-peer data sharing group;

FIGS. **2**A to **2**F are screen shots of a user interface according to an embodiment;

FIG. **3** is a flowchart of a method for limiting a time for which location data sharing is enabled;

FIGS. **4**A to **4**D are screen shots of a user interface according to an embodiment;

FIGS. **5**A to **5**C are screen shots of a user interface according to an embodiment;

FIGS. **6**A to **6**E are screen shots of a user interface according to an embodiment;

FIG. **7** is a flowchart of a method for limiting a time for which location data sharing is enabled;

FIG. **8**A is a block diagram of elements of a user device;

FIG. **8**B is a block diagram of elements of a user device; and

FIG. **9** is a block diagram of a mobile device on which the methods described herein may be executed.



## DETAILED DESCRIPTION

A data sharing group allows members of the group to share data with other members of the group. Users can create different groups of trusted members for different purposes, for example: school friends; family; co-workers; golf foursome; small business; book club; and hockey team, among others. Some data sharing groups are managed with the use a server, through which the data to be shared is sent. The data in some data sharing group applications is stored on a server and accessed from the server by the group members.

Data sharing can also be accomplished, in some embodiments, with a peer-to-peer data sharing group. In peer-to-peer data sharing groups, data to be shared is sent from one user device to at least one other user device in the peer-to-peer group and stored on the at least one other user device. Each device of a peer-to-peer data sharing group has a copy of all the data shared with and received by that member of the group. The peer-to-peer data sharing group is entirely controlled on the user devices as well.

An exemplary embodiment of a peer-to-peer data sharing group will now be described with reference to FIG. **1**. FIG. **1** shows a peer-to-peer data sharing group **100**, comprising six members **101**, **102**, **103**, **104**, **105**, and **106**. Of course, the peer-to-peer group can comprise any number of members and six are shown in this example for illustrative purposes only. Each member **101**, **102**, **103**, **104**, **105**, and **106** of the group **100** can communicate with all of the other members **101**, **102**, **103**, **104**, **105**, and **106**. In some embodiments private communications can also take place between selected members of the group. Data **110** represents data shared by all of the group members, a copy of which is stored on each group member's device. In some embodiments, Data **110** may only be shared by selected members of the group, in which case it is only stored on the selected members' devices. Group members send messages between one another in order to share Data **110**, as described in more detail below.

To communicate data to multiple users, in an embodiment of the peer-to-peer data sharing group **100**, traffic from any one member is directed through at least a relay or router having the ability to direct the traffic to the respective members of the group **100**. In some embodiments, each group member has an associated address such as a Personal Identification Number (PIN) or an IP address. In some embodiments, the relay or router has the ability to accept from a sending group member a single message containing the addresses of multiple receiving group members, and to redistribute the message independently to each of the multiple receiving group members. In some embodiments, the relay or router subsequently provides the sending group member with a delivery acknowledgement when each of the receiving group members receives the message. As a result, despite having sent only a single message to the relay or router, the sending group member is able to track the delivery of the message to each of the receiving group members independently.

In peer-to-peer data sharing groups, members can use any user device capable of communicating with the other members for sharing the data. Non-limiting examples include mobile electronic devices, mobile telephones, laptop computers, personal computers, personal digital assistants, among others.

Non-limiting examples of data that can be shared are location data, images, lists, contact information, calendar information, among others. Examples of location data that can be shared are a location entered by a member, a location selected by a member, a location obtained from a location determina-

tion system on a user device, a location calculated based on data available from a position broadcast system, such as GPS, GLONAS or systems based on triangulation of signals from antennae.

Shared location data can be displayed on user interfaces as text information, image data, such as a map, a video stream or any other suitable interface or can be output to a user as an audio stream. It is to be understood that any suitable output can be used.

Shared location data can be used to present locations of one or more members of a peer-to-peer group on a map. The location data can also be used to track location history of group members or location status of group members. Non-limiting examples of how the shared location data can be used to display status of group members are shown in the screen shots of FIGS. **2**A to **2**C. In FIG. **2**A, a user, Lisa, is identified as searching for satellites. In FIG. **2**B, a group member is identified as being in privacy mode, i.e. this member is not sharing location data. In FIG. **2**C, a group member is identified as sharing his or her location and the location is displayed on the user interface. FIGS. **2**D to **2**F, demonstrate an example of presenting a history of a group members' location. FIG. **2**D shows the present location and FIG. **2**F shows the members location at two other times.

Sharing location data can raise privacy concerns with members of a peer-to-peer data sharing group. A member may only want the other members to be able to find them at certain times or for limited time periods. Members may also be concerned that they will forget to deactivate location sharing once it is enabled. In such a situation, other group members may be able to obtain that member's location data when the member may not desire the location data to be available.

In addition, if location sharing is enabled for extended periods of time, a GPS receiver may be in use for the entire time, which consumes a significant amount of power.

Setting a time limit for how long location sharing is enabled can alleviate a member's concern of forgetting to deactivate the location sharing. As well, if location data to be shared is obtained from a GPS receiver, for example, providing a member with an option to set a time limit during which location sharing is enabled can conserve power consumption in a user device used by the member, for example if the GPS receiver is turned off or not required to continually provide location data.

Thus, in one aspect, there is provided a user device comprising: an output interface for transmitting data to at least one other user device of a data sharing group, the data sharing group comprising at least two user devices inclusive of the user device, each user device of the data sharing group configured to store data shared by user devices of the data sharing group on the respective user device and to maintain a list of the user devices in the data sharing group; a user interface, configured to receive an instruction to enable location data sharing for a limited time period after which location sharing is to be disabled; and a location sharing module configured to, during the limited time period, provide location data for the user device to the output interface to be transmitted to the at least one other user device of the data sharing group.

In another aspect, there is provided a method for limiting a time for which location data sharing is enabled for a user device of a data sharing group, the data sharing group comprising at least two user devices inclusive of the user device, each user device of the data sharing group configured to store data shared by user devices of the data sharing group on the respective user device and to maintain a list of the user devices in the data sharing group, the method comprising: receiving an instruction through a user interface on the user device indicating that location data sharing is to be enabled for a limited time period after which location sharing is to be disabled; obtaining location data for the user device during the limited time period; and transmitting the location data to at least one other user device of the sharing group during the limited time period.

In another aspect, there is provided a computer readable medium having computer executable instructions stored thereon, that when executed cause a processor to implement a method for limiting a time for which location data sharing for a user device of a data sharing group is enabled, the data sharing group comprising at least two user devices inclusive of the user device, each user device of the data sharing group configured to store data shared by user devices of the data sharing group on the respective user device and to maintain a list of the user devices in the data sharing group, and the method comprising: receiving an instruction indicating that location data sharing is to be enabled for a limited time period after which location sharing is to be disabled; obtaining location data for the user device; and instructing an output to transmit the location data to at least one other user device of the data sharing group during the time limited period.

Referring now to FIG. **3**, a method for limiting a time for which location data sharing is enabled for a user device in a data sharing group will be described. In this embodiment, the data sharing group comprises at least two user devices, each user device of the data sharing group configured to store data shared by user devices of the data sharing group on the respective user device and to maintain a list of the user devices in the data sharing group. In some embodiments, the data sharing group is a peer-to-peer data sharing group.

The method comprises at step **202**, receiving an instruction through a user interface on the user device indicating that location data sharing is to be enabled for a limited time period, after which location sharing is to be disabled. Next, at step **204** location data for the user device is obtained during the limited time period. Finally, at step **206**, the location data is transmitted to at least one other user device in the data sharing group during the limited time period. In some embodiments, the location data is obtained periodically during the time period. Likewise, the location data, in some embodiments, is sent on a periodic basis to the at least one other user device. In some embodiments, the data is sent to the at least one other user device through a relay.

In an embodiment receiving location data for the user device comprises obtaining a current location from GPS data for the user device. Other embodiments, include but are not limited to, obtaining a location selected by a user, obtaining a location from a location determination system on a user device, receiving location data calculated based on data available from a position broadcast system, such as GPS, GLONAS or systems based on triangulation of signals from antennae.

In an embodiment, the method further comprises deactivating location data sharing after the limited time period expires. Another exemplary embodiment comprises turning off a location determination system, such as a GPS receiver on the user device, after the limited time period expires. In some embodiments, a notification is created indicating that the location data sharing has been deactivated after the limited time period expires. In yet another embodiment, the device may resume following a pre-established schedule of times during which to share or not share location data, as described below.

The instruction received through the user interface can be received in any format that permits the user to enter or select the limited time period. In one exemplary embodiment, the

method further comprises presenting options on the user interface for selecting time periods for the limited time period. For example, if the user interface is a display screen, a window such as that shown in FIG. **4**A can be presented on a display of a user device, once the user has selected an option to share his or her location. In FIG. **4**A, a pull down menu **302** is presented from which the user can select how long location sharing is to be enabled. Selecting the pull down menu, in this particular example, presents a list of predefined time periods, as shown the screen shot in FIG. **4**B, where the list **304** comprises the choices of 30 minutes, 1 hour, 2 hours, and 4 hours. Of course, this example is for illustrative purposes only and in other embodiments, other time periods may be presented in the list. As well, the list may be presented in any manner. For example, a new window can be opened. In other embodiments, a window is presented on the user interface in which a time period can be entered manually. In still further embodiments, the option to manually enter a time period is given together with the list of predefined time periods.

In some embodiments, an option can be presented to share a user device's location with all members of a peer-to-peer group or with selected members. An example of a user interface presenting such an option is shown in FIGS. **4**C and **4**D.

In a still further embodiment, the method comprises presenting an option to select specific days and times for which to enable location sharing. These days and times can be selected for a single iteration in some embodiments or on a recurring basis in other embodiments. Exemplary implementations of this embodiment are shown in the screen shots depicted in FIGS. **5**A to **5**C and FIGS. **6**A to **6**E. In FIG. **5**A, the user of the device in the data sharing group has been presented with and has selected the option **402** to choose specific days and times to share his or her location with other members of the group. For illustrative purposes only, this screen shot also shows two other options: never share my location **404** and always share my location **406**. Any number or combination of options can be presented in other embodiments and implementations. In the implementation shown in FIGS. **5**A to **5**C, once the user selects to choose specific days and times, the display changes to a new window shown in FIG. **5**B, which presents two more options: to share his or her location at specific times **412** or at the times selected below **414**, where a list of time periods **416** is listed. In this particular example, the user has chosen to select the time periods from the list **416**. FIG. **5**C shows a screen shot of the list **416** where the member has selected to share location on weekday mornings, afternoon and after school.

FIGS. **6**A to **6**E illustrate an exemplary implementation, whereby the user can select specific times to share his or her location. FIG. **6**A depicts the same window as in FIG. **5**B. However, in this screen shot, the user has chosen the share his or her location at specific times **502**. This selection results in the next screen, shown in FIG. **6**B, which gives instructions on how to choose times from a calendar that is presented on the following screen which is shown in FIG. **6**C. FIGS. **6**D and **6**E show an example of what the screen looks like when the user highlights and selects time periods. Of course, FIGS. **6**A to **6**E show one specific implementation and other embodiments, configurations and implementations are possible.

The methods described herein can be implemented by software, hardware, firmware or any combinations thereof or by any other suitable structure.

In another aspect, a computer readable medium having computer executable instructions stored thereon, that when executed cause a processor to implement a method for limiting a time for which location data sharing for a user device of a data sharing group is enabled is provided. The data sharing group comprises at least two user devices, each user device of the data sharing group configured to store data shared by user devices of the data sharing group on the respective user device and to maintain a list of the user devices in the data sharing group. The method implemented comprises the steps shown in the flowchart of FIG. **7**.

The method implemented starts at step **602** with receiving an instruction indicating that location data sharing is to be enabled for a limited time period. At step **604**, location data for the user device is obtained. At step **606**, an output interface is instructed to transmit the location data to at least one other user device of the data sharing group during the time limited period.

Instructing the output interface to transmit the location data can comprise instructing the output interface to transmit the location data to selected members of the data sharing group, in some embodiments. For example, the user may only want to share location with certain members of the group. The method can be configured to present an option to select the members with which the user's location should be shared. The selected other members are the only members with which location data will then be shared.

Different embodiments of the computer readable instructions can implement any of the methods described herein.

In one embodiment of the computer readable medium, the location data for the member is obtained from GPS (Global Positioning System) data. GPS data can be obtained, for example, from a GPS chipset or GPS receiver in a user device, such as a mobile electronic device.

Referring now to FIG. **8**A, a user device **700** will now be described. The user device **700** comprises an output interface **702**, a user interface **704** and a location sharing module **706**. The user device, in some embodiments, is a mobile device, such as a mobile telephone, a laptop computer or a personal digital assistant. In other embodiments, the user device is a personal computer.

The output interface **702** is for transmitting data to at least one other user device of a data sharing group, the data sharing group comprising at least two user devices, each user device of the data sharing group configured to store data shared by user devices of the data sharing group on the respective user device and to maintain a list of the user devices in the data sharing group. In a mobile device, the output interface **702** may be a transmitter. Alternatively, the output may be a port which may connectable to a communication system, such as a telephone network or a cable network or a wireless network.

The user interface **704** is for receiving an instruction to enable location data sharing for a limited time period, after which location sharing is to be disabled. Examples of user interfaces include, but are not limited to, a display screen on an electronic device, a keyboard, a touch screen, or a voice enabled input system. It is to be understood that the user interface **704**, in some embodiments, is not exclusively for receiving an instruction to enable location data sharing. The user interface **704** can be used by other applications operating on the user device. In user devices **700** where the user interface **704** is a touch display screen, the instruction can, for example, be received using screens or windows, such as those shown in FIGS. **5**A to **5**C and **6**A to **6**E.

The location sharing module **706** is configured to, during the limited time period, provide location data for the user device to the output **702** to be transmitted to the at least one other user device. The location sharing module **706**, in some embodiments, can implement any of the methods described

herein. Furthermore, the location sharing module **706** can be implemented using software, hardware, firmware or combinations thereof.

The limited time period during which the location module **704** provides location data to the output **706** can be in any of the forms discussed herein. For example, the limited time period, in some embodiments, commences upon receipt of the instruction. In other embodiments, the limited time period comprises a recurring time period. In still further embodiments, the limited time period is a time period selected by the member from a list of time periods.

In some embodiments of the user device **700**, a location determination system from which the location sharing module receives the location data is included. The location determination system, in some embodiments comprises a GPS (Global Positioning System) receiver. The location determination, in some embodiments, may further comprise a processor for calculating location based on data received from the GPS receiver or any other device or system that provides location data to users. In other embodiments, the location determination system is a system that calculates location based on triangulation of radio signals. Other location determination systems include GLONAS and Galileo.

In some embodiments, the user device calculates the location data. In other embodiments, it is provided by an external position broadcast system. In other embodiments, the location data is a location input by the member into the user device.

The user device **700**, in some embodiments, further comprises a memory for storing data shared by the user devices of the data sharing group. In other embodiments, the user device **700** further comprises an input interface for receiving data shared by user devices of the data sharing group. The user device **700**, in some implementations, further comprises a timer configured to track the limited time period. The timer can be any timing device used in electronic devices. In some embodiments it is the clock used by a processor in the user device. It is to be understood that these embodiments are not mutually exclusive and can be implemented in any combination.

An exemplary embodiment of a user device is depicted in FIG. **8**B. In this embodiment, a user device **750** comprises an input interface **762**, a memory **764**, a user interface **754**, a location sharing module **756** and an output interface **752**. The user interface **754**, a location sharing module **756** and an output interface **752** are similar in function and configuration to the user interface **704**, the location sharing module **706** and the output interface **702** described with reference to FIG. **8**A. The input interface **762** is for receiving data from other devices in a data sharing group, such as a peer-to-peer data sharing group. The memory **764** is for storing the data received.

Referring now to FIG. **9**, shown is a block diagram of another mobile device **800** that may implement any of the methods described herein. It is to be understood that the mobile device **800** is shown with very specific details for example purposes only.

A processing device (a microprocessor **828**) is shown schematically as coupled between a keyboard **814** and a display **826**. The microprocessor **828** controls operation of the display **826**, as well as overall operation of the mobile device **800**, in response to actuation of keys on the keyboard **814** by a user.

The mobile device **800** has a housing that may be elongated vertically, or may take on other sizes and shapes (including clamshell housing structures). The keyboard **814** may include a mode selection key, or other hardware or software for switching between text entry and telephony entry. The keyboard **814** is an example of an implementation of the user interface **704** or **754** described with reference to FIGS. **8**A and **8**B.

In addition to the microprocessor **828**, other parts of the mobile device **800** are shown schematically. These include: a communications subsystem **870**; a short-range communications subsystem **802**; the keyboard **814** and the display **826**, along with other input/output devices including a set of LEDS **804**, a set of auxiliary I/O devices **806**, a serial port **808**, a speaker **811** and a microphone **812**; as well as memory devices including a flash memory **816** and a Random Access Memory (RAM) **818**; and various other device subsystems **820**. The mobile device **800** may have a battery **821** to power the active elements of the mobile device **800**. The mobile device **800** is in some embodiments a two-way radio frequency (RF) communication device having voice and data communication capabilities. In addition, the mobile device **800** in some embodiments has the capability to communicate with other computer systems via the Internet.

Operating system software executed by the microprocessor **828** is in some embodiments stored in a persistent store, such as the flash memory **816**, but may be stored in other types of memory devices, such as a read only memory (ROM) or similar storage element. In addition, system software, specific device applications, or parts thereof, may be temporarily loaded into a volatile store, such as the RAM **818**. Communication signals received by the mobile device **800** may also be stored to the RAM **818**.

The microprocessor **828**, in addition to its operating system functions, enables execution of software applications on the mobile device **800**. A predetermined set of software applications that control basic device operations, such as a voice communications module **830**A and a data communications module **830**B, may be installed on the mobile device **800** during manufacture. In addition, a personal information manager (PIM) application module **830**C may also be installed on the mobile device **800** during manufacture. The PIM application is in some embodiments capable of organizing and managing data items, such as e-mail, calendar events, voice mails, appointments, and task items. The PIM application is also in some embodiments capable of sending and receiving data items via a wireless network **810**. In some embodiments, the data items managed by the PIM application are seamlessly integrated, synchronized and updated via the wireless network **810** with the device user's corresponding data items stored or associated with a host computer system.

In addition, a software application to perform a location sharing function **830**D may be installed. The location sharing function **830**D may implement any of the methods described herein for limiting a time for which location data sharing is enabled for a user device of a peer-to-peer data sharing group. The location sharing function **830**D is an exemplary implementation of location sharing modules **706** and **750** described with reference to Figures A and B.

As well, additional software modules, illustrated as another software module **830**N, may be installed during manufacture.

Communication functions, including data and voice communications, are performed through the communication subsystem **870**, and possibly through the short-range communications subsystem **802**. The communication subsystem **870** includes a receiver **850**, a transmitter **852** and one or more antennas, illustrated as a receive antenna **854** and a transmit antenna **856**. The transmitter **852** and transmit antenna **854** are an exemplary implementation of the output interfaces **702** and **752** described with reference to FIGS. **8**A and **8**B. In

addition, the communication subsystem **870** also includes a processing module, such as a digital signal processor (DSP) **858**, and local oscillators (LOs) **860**. The specific design and implementation of the communication subsystem **870** is dependent upon the communication network in which the mobile device **800** is intended to operate. For example, the communication subsystem **870** of the mobile device **800** may be designed to operate with the Mobitex™, DataTAC™ or General Packet Radio Service (GPRS) mobile data communication networks and also designed to operate with any of a variety of voice communication networks, such as Advanced Mobile Phone Service (AMPS), Time Division Multiple Access (TDMA), Code Division Multiple Access CDMA, Personal Communications Service (PCS), Global System for Mobile Communications (GSM), etc. Other types of data and voice networks, both separate and integrated, may also be utilized with the mobile device **800**.

Network access requirements vary depending upon the type of communication system. For example, in the Mobitex™ and DataTAC™ networks, mobile devices are registered on the network using a unique Personal Identification Number (PIN) associated with each device. In GPRS networks, however, network access is associated with a subscriber or user of a device. A GPRS device therefore requires a subscriber identity module, commonly referred to as a Subscriber Identity Module (SIM) card, in order to operate on a GPRS network.

When required network registration or activation procedures have been completed, the mobile device **800** may send and receive communication signals over the communication network **810**. Signals received from the communication network **810** by the receive antenna **854** are routed to the receiver **850**, which provides for signal amplification, frequency down conversion, filtering, channel selection, etc., and may also provide analog to digital conversion. Analog-to-digital conversion of the received signal allows the DSP **858** to perform more complex communication functions, such as demodulation and decoding. In a similar manner, signals to be transmitted to the network **810** are processed (e.g., modulated and encoded) by the DSP **858** and are then provided to the transmitter **852** for digital to analog conversion, frequency up conversion, filtering, amplification and transmission to the communication network **810** (or networks) via the transmit antenna **856**.

In addition to processing communication signals, the DSP **858** provides for control of the receiver **850** and the transmitter **852**. For example, gains applied to communication signals in the receiver **850** and the transmitter **852** may be adaptively controlled through automatic gain control algorithms implemented in the DSP **858**.

In a data communication mode, a received signal, such as a text message or web page download, is processed by the communication subsystem **870** and is input to the microprocessor **828**. The received signal is then further processed by the microprocessor **828** for an output to the display **826**, or alternatively to some other auxiliary I/O devices **806**. A device user may also compose data items, such as e-mail messages, using the keyboard **814** and/or some other auxiliary I/O device **806**, such as a touchpad, a rocker switch, a thumb-wheel, or some other type of input device. The composed data items may then be transmitted over the communication network **810** via the communication subsystem **870**.

In a voice communication mode, overall operation of the device is substantially similar to the data communication mode, except that received signals are output to a speaker **811**, and signals for transmission are generated by a microphone **812**. Alternative voice or audio I/O subsystems, such as a voice message recording subsystem, may also be implemented on the device **800**. In addition, the display **826** may also be utilized in voice communication mode, for example, to display the identity of a calling party, the duration of a voice call, or other voice call related information.

The short-range communications subsystem **802** enables communication between the mobile device **800** and other proximate systems or devices, which need not necessarily be similar devices. For example, the short-range communications subsystem may include an infrared device and associated circuits and components, or a Bluetooth™ communication module to provide for communication with similarly-enabled systems and devices.

What has been described is merely illustrative of the application of the principles of methods, modules and devices described herein. Other arrangements and methods can be implemented by those skilled in the art without departing from the spirit and scope of the embodiments.

The invention claimed is:

**1**. A user device comprising:

an output interface for transmitting data to at least one other user device;

a user interface configured to receive an instruction to enable periodic location data sharing of location data for the user device for a limited length of time after which location sharing is to be disabled; and

a location sharing module configured to:

during the limited length of time, periodically provide location data for the user device to the output interface to be transmitted to the at least one other user device; and

outside the limited length of time, cease to periodically provide location data for the user device to the output interface;

wherein the instruction to enable periodic location data sharing of location data for the user device for a limited length of time defines a bounded length of time starting from a time at which the instruction is received; and

wherein periodically providing location data for the user device to the output interface comprises:

periodically sending a single message to a relay or router for independent distribution to the at least one other user device without the location data being retained by a server, the single message containing the location data and addresses of the at least one other user device, wherein the user device subsequently receives from the relay or router a delivery acknowledgment when each of the at least one other user device receives the single message.

**2**. The user device of claim **1**, wherein the user interface permits selection of the bounded length of time from a set of predefined time lengths.

**3**. The user device of claim **2**, wherein the set of predefined time lengths is presented as a list.

**4**. The user device of claim **2**, wherein the set of predefined time lengths comprises 30 minutes, 1 hour, 2 hours, and 4 hours.

**5**. The user device of claim **2**, wherein the user interface permits manual entry of the bounded length of time.

**6**. The user device of claim **1**, further comprising a touch display screen for presenting the user interface and receiving the instruction.

**7**. The user device of claim **1**, further comprising a location determination system from which the location sharing module receives the location data.

**8**. The user device of claim **7**, wherein the location determination system comprises a GPS (Global Positioning System) receiver.

9. A method for limiting a time for which location data sharing is enabled for a user device, the method comprising:

receiving an instruction through a user interface on the user device indicating that periodic location data sharing of location data for the user device is to be enabled for a limited length of time after which location sharing is to be disabled;

during the limited length of time, periodically obtaining location data for the user device and periodically transmitting the location data to at least one other user device; and

outside the limited length of time, cease periodically transmitting the location data;

wherein the instruction to enable periodic location data sharing of location data for the user device for a limited length of time defines a bounded length of time starting from a time at which the instruction is received; and

wherein periodically transmitting the location data to the at least one other user device comprises:

periodically sending a single message to a relay or router for independent distribution to the at least one other user device without the location data being retained by a server, the single message containing the location data and addresses of the at least one other user device, wherein the user device subsequently receives from the relay or router a delivery acknowledgment when each of the at least one other user device receives the single message.

10. A non-transitory computer readable medium having computer executable instructions store thereon, that when executed cause a processor to implement a method for limiting a time for which location data sharing is enabled for a user device, the method comprising:

receiving an instruction through a user interface on the user device indicating that periodic location data sharing of location data for the user device is to be enabled for a limited length of time after which location sharing is to be disabled;

during the limited length of time, periodically obtaining location data for the user device and periodically transmitting the location data to at least one other user device; and

outside the limited length of time, cease periodically transmitting the location data;

wherein the instruction to enable periodic location data sharing of location data for the user device for a limited length of time defines a bounded length of time starting from a time at which the instruction is received; and

wherein periodically transmitting the location data to the at least one other user device comprises:

periodically sending a single message to a relay or router for independent distribution to the at least one other user device without the location data being retained by a server, the single message containing the location data and addresses of the at least one other user device, wherein the user device subsequently receives from the relay or router a delivery acknowledgment when each of the at least one other user device receives the single message.

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